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# in Depth

Gerald Weinberg on becoming a technical leader/65

# Memorex on auction block

# Sperry merger seen trigger; Burroughs mum on sale

By Donna Raimondi

In the midst of digesting the largest computer industry acquisition ever, Burroughs Corp. has quietly placed Memorex Corp., its peripherals subsidiary, up for sale, according to a Memorex executive.

The disclosure last week by Memorex Marketing Vice-President Bill Etheredge apparently caught Burroughs by surprise. After initially saying a response was being prepared, Burroughs spokesmen instead offered a terse "no comment."

Burroughs acquired Memorex, a supplier of IBM plug-compatible and other peripheral products, in 1982. This year, Burroughs also won a lengthy campaign to convince Sperry Corp. to merge the two mainframe vendors in a \$4.8 billion transaction.

Some analysts say offers of \$500 million to \$800 million have been made by major vendors such as Fujitsu America Ltd., Amdahl Corp., Hitachi America Ltd. and Telex Computer Products, Inc., but each of those rumored suitors denied plans to purchase Memorex. Analysts say that at least one and possibly two suitors are waiting for

"The stories about who will buy Memorex are strictly rumor," Etheredge said. But Michael Blumenthal, president and CEO of the merged companies, needs to raise cash and will entertain the notion of

selling any piece of the business for the right price, Etheredge added. Blumenthal's June statement to that effect has stirred buyer interest in various pieces of the company, including Memorex, Etheredge said. Although Burroughs does not reveal Memorex's financial details, it is believed the subsidiary has become profitable only in the past year. One analyst said Memorex generated \$1 billion in revenue

"If Memorex gets sold, it will certainly happen before December to reflect on the profit-and-loss statement," said industry analyst Louise Biggs of Dataquest, Inc. in San Jose, Calif. Memorex is divided into several sections, some of which are highly "I don't anticidesirable, she said. See MEMOREX page 4

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E. F. Hutton's contract for 10,000 PCs is awarded to NCR. Page 13.

RCA pulls the plug on its last connection to the glory days of mainframe manufacturing. Page 2.

The selective "Enterprise" IBM discount maintenance program ends, replaced with a broader plan for corporatewide service. Page 6.

Wang enters the laptop scrimmage with a Japanese-built model and built-in printer. Page 10.

Tape cache enables a Texas firm to delay the expense of tape cartridges for two years. Page 31.

Lotus today is set to unveil its Manuscript word processing package for the technical market, but some sources pre-See NEWS page 4

# Great Communicator: Users see 9370 as bridge to mainframe world

With the recent addition of the 9370 Information System to its processor line, IBM has revolutionized the way 370 hosts communicate with each communicate with each other and the outside world.

Targeting commercial and technical distributed processing users who already have installed bases of other vendors' comput-ers, IBM has for the first time made communications with non-IBM products an intrinsic element of the 370/Systems Network Architecture environment.

Ground-breaking capa-bilities offered by the 9370 include direct board-level links to both 802.3 Ethernet and IBM Token-Ring networks; a software facility that enables users to transparently access SQL bases on up to eight 9370 hosts as if they resided on one system; and communications with IBM and non-IBM systems supporting the Transmission Control Protocol/Internet Protocol, over either Ethernet or the Token-Ring network. "IBM has finally brought the 370 architecture into the office," says Stephen Sperandio, director of financial information services at Blue Cross/Blue Shield of Massachusetts.

"This is probably their most significant announce-ment in a long time," Sperandio says.

Unlike the System/36, which "forces companies that already have 370 hosts to cope with an entirely different architec-ture," the 9370 enables companies to move software applications around See 9370 page 8

**CW PROFILE** 

# MBA's recipe for success has dough rising at Pillsbury MIS

By David A. Ludh

queezing in a meeting

during breakfast in his hotel suite, genial yet intent in sizing up the focus of an interview. John Hammitt exhibits the businesslike demeanor suited to the concept of chief information

Indeed Hammitt. who started his career as a chemical en-

gineer and who holds an MBA from the University of Chica-go, describes his role at Pills-

bury Co. as guiding information systems strategy and investments, with no day-today responsibilities.

But, unlike some others in such a position. Hammitt eschews the title of chief information officer, taking instead vice-president for information management. In fact, he thinks the title of CIO

John Hammitt is a little presumptu-

"I think we do ourselves See DOUGH page 6

# **DEC soars, IBM struggles** Armonk shake-up

# follows financials

By Clinton Wilder

Third-quarter financial results announced last week by IBM and Digital Equipment Corp. dramatically under-scores the contrasting performances of the industry's two

leading players in 1986.

IBM, in its largest year-toyear quarterly profit drop in at least five years, said earnings fell 27% on a tiny 1.8% gain in revenue. DEC, continuing its meteoric performance in a sluggish industry, reported that profits soared 153% on a 26% rise in sales.

Separately, IBM Friday an-

nounced a major management shake-up as former Chief Financial Officer Allen J. Krowe took over responsibility for two key product units and Rolm Corp. "Krowe now has the whole bag where IBM is most concerned — its critical market areas for the future, said International Data Corp. analyst Jack Hart, a 20-year IBM veteran.

IBM Chairman John Akers continued to cite weak macroeconomic factors in the U.S. and abroad. But analysts believe that changing growth patterns in the computer industry play to IBM's mid-range systems weaknesses and DEC's strengths.

'DEC has all of its energies See DEC page 12

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NEWSPAPER

# **Unplugging Univac cuts last** RCA ties to mainframe era

By Eddy Goldberg RCA Corp. recently shut down its last Univac 90/80, the final link to its history as a computer manufacturer that ended abruptly 15 years ago on 'Black Friday" in September 1971.

"It's the end of an era," an RCA corporate data center employee said. The weekend of Sept. 27th was the last time that any major processing was done here on the 90/80. Then we let it spin its cycles out for a week and shut it down Oct. 4th." The cables have been pulled, and the box was scheduled to be moved to a ware-

house last Friday, the source added.
Back in 1970, RCA President and
Chief Executive Officer Robert W.
Sarnoff stated, "We are determined
to attain an industry rank second only to IBM in this country. In order to accomplish this goal, RCA is prepared to commit whatever resources are necessary."

One year later, Sarnoff pulled the plug on RCA's 15-plus years in the computer business. He said the \$500 million needed to keep the business alive for five more years would not be forthcoming. That day became known as Black Friday for thousands of idled RCA employees. Sperry Rand Corp.'s Univac division quickly took over RCA's customer base. RCA, no longer a vendor, became a user of its own computers, which evolved into Univac products.

In 1971, as a user of RCA equipment, Black Friday was "anxiety city for me," the RCA employee said. His fears were eased a few months later when Sperry's Univac division took over, providing manufacturing and maintenance for the computers and jobs for many of the RCA employees.

He said the chief engineer for the RCA 7 virtual processor, a major part of RCA's mainframe plans, was hired by Univac, where he developed a CPU for the Univac 90/80. "It was effectively an extension of the RCA 7, bigger and better," said the employee, who was hired by Sperry in the early 1970s where he worked on 90/ 80 software. He said Sperry also adapted RCA's VMOS, calling it VS/9.

Some years later, when he went to work for RCA, there were two Univac 90/80 systems in its corporate computer center. RCA also had a couple of IBM 370/168 systems at the time, and was in the beginning stages of a conversion plan to IBM equip-

He said the 90/80 was a good system. "It ran well, but we outgrew it." Although Univac's service and support was very good, he said IBM's was even better. The greater avail-ability of software for the IBM systems was an additional factor in RCA's decision to convert to IBM. "It was in May 1980 that we got rid of the last RCA Spectra 70 processor," another RCA employee said.

There are some strange twists to the story of what might have been for RCA, one of the "Seven Dwarfs, a group that also included the five **BUNCH** companies and General Electric Co.

GE sold its computer business to Honeywell, Inc. in 1970, a year before RCA decided to pull out. In 1986. GE, now Honeywell's biggest computcustomer, bought RCA. GE, with its Honeywell and IBM systems, is in the process of merging with RCA and its IBM systems, just as RCA puts its last Univac 90/80 to rest. RCA, which declared in 1970 it would be No. 2 to IBM, just cut the final cord to its past as a mainframe manufactur-

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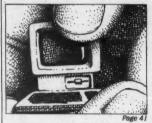
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#### HARDWARE ROUNDUP

Despite competition, the microcomputer world still revolves around IBM. But challengers are fighting back with price/performance ratios. This week's Hardware Roundup looks at microcomputers. By David Bright/ 41

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Living in the shadow: Cobol 85 offers enhancements sought by mainframe users. Yet these same users favor more conventional tools. By Lemuel Skidmore/57

Self-blindness, the 'No Problem Syndrome' and other obstacles to becoming a technical leader. By Gerald Wein-

Still No. 3, but trying harder: In 1981, Chrysler invested millions in CAD/CAE systems and high-speed networking. Slowly but surely, that investment is paying off. By Jean Bozman/ 77

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# Lotus to download from MVS

CAMBRIDGE, Mass. -- Lotus Development Corp. last week said that it will be replacing its VM electronic software distribution system with a commercial offering running under both VM and MVS.

Lotus had announced electronic distribution in August as part of its Multi-Value Plan providing service and support to large companies. With the system, microcomputer software be downloaded from IBM 370 mainframes to personal computers with IBM 3270 terminal emulation. Tangram Systems Corp., based in Cary, N.C., is developing the system with Lotus.

'The primary benefit of the system is found in reduced staff time and expense in distributing software product upgrades, drive changes and templates to large numbers of users," said Alexander Crosett, manager of Lotus's Information Center Group. The system will initially work with Lotus 1-2-3 and Symphony, but plans call for all Lotus software to be included.

Lotus refuses to specify the minimum number of units needed to qualify for the plan. However, Lotus's Special Bids volume purchase plan requires a 500-unit minimum. Pricing and the required volume will be dis closed when the product begins shipping, a Lotus spokeswoman said. Each customer's installed base of Lotus software will count toward the minimum number, and software pricing will remain on a per-copy basis, added.

In addition to Lotus software and a company's internal templates and applications, the distribution system can also be used to download other vendors' unprotected software. Beta testing for the MVS system will begin by year end, and the VM replacement will follow in the first half of 1987.

The original electronic distribution plan was developed for use by Exxon Corp., but other customers soon requested a similar program, the spokeswoman said.

The system can support both VM and MVS because it is VTAM-based, rather than being tied to an operating system-specific teleprocessing monitor, said Art Ingram, Tangram vicepresident of marketing and sales. The system is built around Tangram's Arbiter micro-to-mainframe cooperative processing system.

PAGE 17 ILLUSTRATION BY ALAN WITSCHONKE

# TURB6

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# TOP OF THE NEWS

dict that the flexible, full-featured program will be popular for general use as well. The \$495 package was built to support the new Her cules Graphics Card Plus, though the card is not required. al-

On Oct. 27, Ashton-Tate is expected to announce Rapid File, formerly code-named Black Gold, a file management system aimed at Intel 8086/8088-based personal computers. Rapid File can import data from Dbase III with a simple keystroke combination, but it reportedly does not use the same file format as Dbase. According to sources close to Ashton-Tate, the product was delayed because of problems in determining an appropriate interface.

Texas Instruments, which earlier this year introduced its Business System 1000 series of superminicomputers, is scheduled tomorrow to add several models to that series, which has been renamed the System 1000. The additions include a low-end model in the Sys-tem 1500 family that was announced in March and the new System 1100 family. The Unix-based system now will support two to 24 users in the System 1100 line and 30 to 128 users in the System 1500 family, according to TI officials.

A more sophisticated release of the end-user version of Software AG of North America's Natural, a fourth-generation language, is coming in December. Version 2 of Super Natural will add data base and prototyping capabilities to what has been a basic query and reporting tool, according to officials involved in the project.

In a development that could signal a change in the ranking of the microcomputer software firms, Lotus announced first-quarter sales of \$65,560,000, up 32% from the previous year's quarter, with net income of \$9,528,000, an increase of 50% from the previous year's quarter. Lotus rival Microsoft recently estimated first-quar-ter sales of \$66 million, with net income of \$15 million.

# Memorex on the auction block

From page 1

pate that the whole company would be sold, but their international unit has always been very strong. It accounts for half their business, and it would be a dynamite buy for anybody looking for European penetra-tion," she added.

David Vellante, storage analyst at International Data Corp. in Framingham, Mass., however, disagreed that the company will be split along European and North American lines. "If there is a split, it would be to separate the storage part of the business from the terminals side, but given the \$500 million to \$800 million price tag we hear about, it seems like that would be for the whole company."

While Memorex employees heard that Blumenthal would have made all decisions affecting parts of the companies by mid-October, Etheredge said, the decisions affecting Memorex have been put off until the end of the year. "By then, we should know what the name of the combined [Burroughs and Sperry] companies is and what the disposition of parts of the company, including Memorex, are." At least five task force groups, composed of Burroughs, Sperry and Memorex leaders, are meeting to iron out strategies, Etheredge said.

The Sperry/Memorex workstation collaboration introduced today (see related story page 5) illustrates the apparent synergy between companies that Blumenthal talked about as one of the reasons for the Burroughs/ Sperry merger, Etheredge said. Shortly after the merger, Burroughs strongly urged Memorex to scrap a year-old, in-house development pro-ject for a 3270-compatible intelligent workstation and instead use Sperry's PC/IT and PC/Micro IT as the basis for the product, he added.

By the end of June — the month in which Burroughs and Sperry decided to merge - Burroughs had decided that Memorex was a logical distributhat memorex was a logical distribu-tion system for the Sperry product, Etheredge said. "So we slowed our development effort, saw that the Sperry engine was as good as or better than ours, and we used it."

But the prospect of Sperry using Memorex products in its own computer systems is dim, Vellante said. "Me morex will have to compete for Sperry's business. Amperif is making a solid-state device for Sperry that the company is very happy with, and Sperry signed an agreement with Hi-tachi for disk drives and optical disk Sperry spokesmen were not available for comment.

Meanwhile, Memorex is filling out its IBM plug-compatible peripherals line, Etheredge said. It has caught up with the hole in its large-system storage products with today's announce-ment of its double-density IBM 3380type disk drives, and by the summer of 1987 it expects to show a tape cartridge device with an automatic loading device to compete with IBM's

popular 3480 product, he said. Although Memorex is on the selling block, that condition should not affect its customers, Vellante said. 'If someone is willing to pay between \$500 and \$800 million, that's good news," he said. Burroughs accounts for 30% of Memorex' spindle (disk storage) business, and now that Memorex is up to speed technologically, Burroughs would not want to lose that relationship, he added.

# COMPLITERWORLD

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# AT&T profits soar, for now

By Clinton Wilder

NEW YORK - AT&T last week reported a 41% third-quarter earnings increase, mainly because of one-time gains unrelated to operations. But telecommunications warned that it will take a substantial charge in the fourth quarter because of upcoming employment reduction expenses.

AT&T has offered severance packages to mid-level management employees earning between \$30,000 and \$90,000 per year. AT&T has not officially announced the number of jobs it is seeking to cut, but analysts believe the number is at least 25,000.

AT&T reported earnings of \$533 million, or 48 cents per share, compared with \$378 million, or 33 cents per share, a year earlier. But a net to-tal of \$157 million, or 14 cents of the recent quarterly earnings, came from extraordinary gains including a reduction in pension expense. Earnings from operations were slightly below

Revenue also fell slightly, by 2.7%,

to \$8.43 billion for the quarter.

The company took a one-time charge of \$27 million, or 3 cents per share, attributed to work force reductions already identified and consolidation of some facilities

The company said product sales fell 12.6% from year-earlier levels, reflecting "industrywide soft market conditions and competitive pressures." But revenue from services rose 7.2%, chiefly from increased telephone-calling volume producing greater long distance revenue.

Essentially confirming reports that AT&T is retrenching in the computer industry. Olson said the company's new strategy is to focus on strengthening AT&T's core businesses, develop new data networking ca-pabilities and improve its interna-

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# Double-capacity disk storage unit debuts from Memorex

# Proposed sale will have no impact, analyst says

By Donna Raimondi

SANTA CLARA, Calif. morex Corp. today is expected to an-nounce an IBM-compatible, double-capacity disk storage subsystem equivalent to IBM's 3380 Model E se-

The company, which could be sold before the end of the year, according to a spokesman (see story page 1), also released an Expanded Capacity Feature (ECF) for its 6880 solid-state disk subsystem and several products in its terminal and printer lines.

Whether the company is sold should not affect customer reaction to the new products, said industry analyst Louise Biggs of Dataquest, Inc. in San Jose, Calif. "End users for disk drives are not very vendor-loyal. Disk drives are a commodity. The end user chooses for reliability, serviceability and price - not for ven-

dor," Biggs said.

Volume shipments of the 3682 double-capacity disk storage subsystem are planned for the first quarter of 1987. Burroughs Corp. plans to announce that the 3682 will be available in mid-1987 for attachment to its A and V series systems, Memorex said. It will take that long to engineer an interface for the Burroughs ma-

It is unlikely that Sperry Corp. will soon use the Memorex drives, Biggs said, because Sperry recently signed an agreement with Hitachi America Ltd. for double-capacity drives. "Although it would seem to make business sense for Sperry to use them, I don't know how solid the Sperry-Hitachi contract is," she said.

A full string of 3682 drives controller and four storage modules - holds 20G bytes of data and occupies slightly less floor space than a full string of IBM 3380 or Memorex 3680 single-density drives. Configurations range from the 3685 string controller and one 5G-byte 3682 storage module (\$122,480) to the controller and four 5G-byte storage modules (\$416,900).

Each dual-ported 3682 module contains two 2.5G-byte head disk assemblies and four independently addressable actuators, which have access to 1.26G bytes apiece. Average access time is said to be 17 msec. with a data transfer rate of 3M byte/sec. The 3682 can be used in conjunction with the Memorex 3888-23 disk cache storage control unit.

The solid state device's ECF boosts the Hitachi-made 6880's storage capacity from 512M bytes to 2G bytes. Users can choose 6880 configura-tions in 32M-byte and 128M-byte storage increments up to the maximum 2G bytes in a four-cabinet configuration. A 6880 subsystem with a two-director control unit and a 128Mbyte storage unit costs \$380,000. The price for the 2G-byte configuration with a two-director control unit and four 512M-byte storage units is \$4.2

Other products announced include intelligent workstations based on the Sperry PC/IT family of IBM Personal Computer AT-compatible microcom-

puters, terminal and printer prod-

The Memorex 6273 series are IBM 3270-compatible workstations for coaxial environments. The workstations are based on the Sperry PC/IT and PC/MicroIT personal computers. They are said to provide 3270 network users with IBM and compatible mainframe access as well as extensive AT-compatible stand-alone processing capabilities.

The workstation series includes two compact versions, priced at \$5,695 and \$6,095, and two larger models, priced at \$6,195 and \$6,595. All four units use the Intel Corp. 80286 microprocessor, 640K bytes of memory, a 40M-byte hard disk drive, a 1.2M-byte floppy disk drive and Mi-crosoft Corp.'s MS-DOS Version 3.1 single-user operating system.

Also announced were two modular-design display stations for the IBM 3270-compatible market. The are compatible with IBM 360, 370, 3080, 3090, 4300 and 8100 processors as well as IBM-compatible hosts, Memorex said. The displays operate in bisynchronous or Systems Network Architecture/Synchronous Data Link Control environments and can be attached to Memorex or IBM controllers via coaxial cable.

The \$2.195 2180C 14-in color display can display two, four or seven colors. Users can select from three screen formats that display up to

3,440 characters. The \$1,195 2291 12-in. monochrome display is plug-compatible for the IBM 3191 display station. The 2291 has a 122-key modifiable keyboard, green or amber screens and a 36-month warranty. The unit is said to consume about half the energy of an IBM 3191.

The 2124 Model E multifunction printer is a plug-compatible alternative to the IBM 4224 Model 202. It can be used in draft (350 char./sec.) or letter quality (80 char./sec.) mode in office or production environments and can print any of 10 bar codes or optical character readers. The printer will be available late in the fourth quarter of this year and costs \$5,495.

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# Select IBM maintenance plan reborn as standard option

# Corporatewide deal provides discounts

By Jean S. Bozman

IBM earlier this month terminated its Enterprise Maintenance Agreement program, a discount maintenance program formerly available only to top customers, and extended similar savings to more users under a general offering called the Corporate Service Amendment (CSA).

Until now, only IBM's top customers were offered large discounts on IBM maintenance. Under the earlier program, these customers had been given discounts of up to 15% on company wide maintenance.

The amendment to customers' IBM maintenance agreements will give users an average savings of 16% off IBM list prices for maintenance, provided they agree to certain qualifying conditions, according to IBM spokesmen. Chief among the condi-

tions is a provision that users agree to troubleshoot system failures before calling IBM for repairs. IBM also offered to lower maintenance prices for IBM Personal Computers and peripherals by an average of 24%.

ipherals by an average of 24%. In order to qualify for CSA, the customer must first agree to an IBM on-site assessment of its systems procedures, which will cost the customer \$3,500. The assessment of network maintenance procedures, which is more complicated, is priced at \$8,500. IBM will reserve the right to grant or to deny qualification for the

IBM officials added that customers can qualify for CSA if they show a disciplined management of problems from occurrence to resolution, management of changes to equipment configuration or programming and network problem determination and application of specialized network knowledge to complex problems.

Qualification is based on the customer's ability to solve basic problems and to help IBM service reps by handling some troubleshooting before calling for service, IBM claimed.

The move is apparently intended to keep IBM competitive with third-party maintenance firms, such as Sorbus, Inc. and Control Data Corp. These third-party suppliers generally offer rates that are discounted by 20% or more from IBM list prices.

In place since 1984, the Enterprise Maintenance Agreement was offered to some of IBM's largest customers, many of them in the Fortune 100. The earlier program provided discounts on maintenance of all IBM machines throughout a customer's corporation, reducing monthly bills that ran into six figures.

To qualify, the customer had to agree "to develop, implement, monitor and maintain systems management procedures which cover the entire customer enterprise." Further, the company had to agree that, with the exception of a few non-IBM mainframes, all machines and all mainte-

nance would be provided by IBM.
On Oct. 7, IBM officially terminat-

On Oct. 7, IBM officially terminated that plan, which had been open to "some of our very large customers" only, in the words of an IBM spokesman. But the Enterprise Maintenance Agreement already in existence will not expire until Oct. 31, 1987. These users will have until then to switch over to the CSA plan.

Competitors took the news well, having adjusted to the Enterprise Maintenance Agreement during the last year. "I'm not concerned about the IBM programs," said Steve Offield, president of Quadtronix, Inc., a Los Angeles maintenance firm, "because we offer more cost savings than any of the IBM programs do. And we offer improved performance that's documented by our customers. They have never had to call IBM for help."

Bozman is a Computerworld contributor based in Chicago.

# Dough rises at Pillsbury MIS

From page 1

more harm than good by trying to propose titles like that that maybe inflate the position without necessarily having substance behind it," he said during an interview while visiting Dallas.

But Hammitt, 42, who reports to Pillsbury's executive vice-president and chief financial officer, Roger Headrick, says he firmly believes in the value of a corporate information strategist.

That has been his role since joining Minneapolis-based Pillsbury in 1983 after serving as director of information systems for Morton Thiokol. Inc.

Hammitt arrived at Pillsbury after the company had experienced a 10-year hiatus in substantial spending on information systems. "It was more and more difficult to know what was going on on a timely basis," he says. Different people had been in charge of various pieces of the information operation.

Hammitt moved in with a threepronged strategy: to create a culture tying information systems investments more closely to bottom-line considerations, to bring on managers who are well grounded in general business and to tighten management through more stringent accounting, planning and personnel development.

Now, with an information technology blueprint in hand, Hammitt's department is on a track of 20% per year spending growth, a rate that about equals Pillsbury's gain in sales for the past fiscal year. It is introducing systems integrating IBM, Honeywell, Inc. and Hewlett-Packard Co. computers for planning production and distribution for Pillsbury's packaged food and for Burger King Corp. and other restaurant operations. The aim is to provide customers with the lowest possible delivered cost, Hammitt says.

Pillsbury also is in the final stages

of testing the movement of networked computers into outlets of Miami-based Burger King and other restaurant chains, including Steak & Ale and Bennigans. Hammitt declined to elaborate on the projects, calling the details proprietary.

He says the company will realize returns of three to four times the cost of new systems within five years, but he is again taciturn on how the returns are calculated. "We know precisely where we're going to get those returns. We have very specific yardsticks," he says. Successful automation can come though a number of systems, no one of which would be profitable on its own, he adds.

Hammitt's peers cite his success at wedding information systems operations to corporate goals. "He has accomplished that very well in the three years," says Thomas E. Morin, vice-president of corporate services for Medtronic, Inc. of Minneapolis and president of the Society for Information Management executive council. "It's a very important function. Without that, what you have is people planning on the basis of the direction of the technology, rather than on what the business is doing,"

John G. Geiken, president of Norwest Information Services, Inc., a unit of the Minneapolis bank's holding company Norwest Corp., calls Hammitt a leader in that area. "I've been very impressed with what he's doing," Geiken says.

Hammitt's planning has resulted in a corporatewide information systems architecture incorporating data management, communications, hardware, software and users, according to consultant Richard Dooley of The Dooley Group.

As a by-product of that effort and of educating managers about information systems and networking with his peers, Hammitt has fostered an environment of interpersonal communication, a virtue that sounds like motherhood but has often been overlooked by more narrow technologists, Dooley added.

Hammitt, tall and angular, has

Hammitt, tall and angular, has been married four years to the vicepresident of systems development at Burlington Northern Railroad Co. He combines what he terms a strong career focus with interests in cooking, travel, stereo equipment, theater and books that range from history to

He first became involved with computers in managing process-control systems for CPC International, Inc., a New Jersey-based producer of packaged foods, and says his lack of a highly technical background has made it easier to keep such a view.

Hammitt says he believes the most important attribute of an information systems strategist is an ability to regard the systems with a long-term, companywide perspective, in

mitt says.

Other important attributes of the corporate information systems leader are the ability to market ideas and to manage people, he adds.

The individual must be able to read others, communicate effectively with them and, through his demeanor, convey a strength of conviction so that people believe in him as a person as well as in his ideas, Hammitt says. "If we are going to deliver people the promise of the technology, we are going to have to convince people to do things that they wouldn't normally do," he says.

The top information systems executive also must be able to seek out and identify talented people, motivate them and further develop their skills in order to build teams of people who can do extraordinary feats,

"We're in a business climate now that requires that we distinguish ourselves from our competition in whatever way we can. I think that that comes through the creativity of finding some talented people and putting them together and getting out of the way, supporting them in their success."

Hammitt says he disagrees with the notion that the boss should tell other people what to do and be the smartest person in his group. "Our role as leaders is to be a catalyst and a facilitator and a talent scout," he says.

says.

He emphasizes the difference between supervision and leadership.

Some people are gifted leaders by birth or through experience, but others, with hard work, can learn enough to make a stronger contribution, be says.

Hammitt acknowledges that there are several aspects of his work that might not appeal to information systems managers aspiring to a similar

One is an atmosphere of ambiguity, as opposed to the one of precision of technical work. "The answers to most questions are, 'It all depends,' 'Perhaps,' because it's very difficult to find absolute answers to most of the issues we deal with," he says.



order to anticipate problems and op-

"I see an awful lot of people in our profession today who, because they have operated so closely to the technology, lose sight of what value that has to the company at large," he says.

The key is to help top managers appreciate where investments in technology could make a difference, regardless of the details of the investment. "Not having that technical baggage, I've always focused on the larger picture and let a lot of the detail issues fall out of that," Ham-



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# Intel claims multitasking board brings 80386 power to AT

By David Bright
HILLSBORO, Ore. — Intel Corp. will today introduce an 80386-based add-on board that reportedly gives IBM Personal Computer AT systems the power of 80386-based systems at a much lower price.

According to James Johnson, gen-eral manager of Intel's Personal Com-Operation Enhancement (PCEO), the \$1,995 board is a cost-effective way for managers to sample 80386 technology and extend the lives of their AT systems.

Johnson claimed there are two important reasons for buying the In-board 386/AT board: multitasking support and a doubling of perfor-

However, with IBM and Microsoft Corp. yet to fully validate the 80386 market with related MS-DOS products of their own, many managers were noncommittal about Intel's offering. At best, they expressed mild curiosity. Dan Chilcoat, manager of systems and programming at Adolph Coors Co. in Golden, Colo., said his company has some power users who could use the increased performance. Coors has already purchased one Compaq Computer Corp. Deskpro 386 to see what it can do and may investigate the Inboard 386/AT as well, Chilcoat said.

Although Johnson called the board's pricing aggressive, the In-board 386/AT's extra cost could be an inhibiting factor for some managers. "It's a great idea. Tell them to cut the price in half," said Tony Graffeo, vice-president of MIS at Home Insurance Co. in New York. The days of expensive add-on boards are gone. Graffeo said. Since Home Insurance has many ATs, Graffeo likes the idea of upgrading the systems instead of replacing them, but added he would not consider buying the board in quantity until the price comes down. While the 32-bit 80386 micro-

processor supports multitasking, a common complaint from managers is that Microsoft has yet to offer a version of the MS-DOS operating system that takes advantage of that capability. But with software environments from Quarterdeck Office Systems. Inc. and Softguard Systems Co. supporting the 80386's virtual-86 mode of operation. AT users can run sever al applications programs simultaneously, Johnson said. He also expects other vendors to soon announce similar software environments.

"There's always a class of user who needs more speed," Johnson said, concerning performance. While there is not a mass market for this type of product, he said it will appeal to people in engineering and technical applications as well as business users who require more number-crunching power for such applications as large spreadsheets.

Johnson said the board's price could come down in the future. If the component costs drop low enough. PCEO might also offer a similar board for the IBM PC and XT systems, he added.

In its basic configuration, the Inard 386/AT board includes a 16-MHz 80386 and 64K bytes of cache memory. According to Johnson, the board is completely compatible with existing hardware and software. The Inboard 386/AT is activated by unplugging an AT's 80286 processor and inserting a connection to the

With 1M byte of on-board memory, the board retails for \$2,495. A piggyback board, priced at \$645, adds an extra 1M byte of memory or, for \$1,145, an extra 2M bytes. The board is to be available in January 1987.

One vendor developing an 80386based accelerator board maintained that the 80386 has inherent compatibility problems. Trevor Marshall, director of engineering at Definicon Systems, Inc. in Westlake Village, Calif., said that because of those problems, his company's board will have trouble running copy-protected software and software that directly accesses the BIOS.

Marshall claimed all 80386-based products could have similar difficulties. At next month's Comdex/Fall show in Las Vegas, Definicon will introduce its DSI-386 board with 1M byte of random-access memory for about \$2,000, Marshall said.

The compatibility issue was a major reason why 80286-based accelerator cards did not catch on as hoped. Despite the 80286-based boards' lack of popularity, several vendors, such as Phoenix Technologies Ltd. and Applied Reasoning Corp. are busy developing 80386-boards for late 1986 or early 1987 introduction.

# 9370 seen as bridge

From page 1

a distributed processing environment, he adds. "This should help IBM keep its customers from going to other

IBM hopes the 9370's arsenal of connectivity enhancements will enable it to conquer more territory for the 370 line in both the office automation and scientific/ engineering markets, says Lon McCauley, IBM consulting market support represen-

As a departmental office system, the 9370 can be "low-cost and unobtrusive, running the same software as the bigger host processors, including the Professional Office System, and can be integrated into a company's exsolution. isting network McCauley notes.

The 9370's ability to com municate easily with other 370 hosts and run VM software make it a prime candidate to be a departmental processor for Blue Cross/ Blue Shield of Massachusetts, according to Sperandio. Various departments within the company currently suffer from response-time problems while running high-volume, interactive applications on the company's remote 370 mainframe

"It would be nice to take accounts payable, for example, and run it in on a local processor in that work area, then transfer the files up to the mainframe at night," Sperandio says. But to accomplish that, he said, the company needs a departmental processor architecture that is compatible with the larger system. "That rules out the System/36," Sperandio says.

#### **Primary market targets**

IBM's primary target for the 9370 are those in the scientific and engineering markets "who are worried about how to link their IBM MIS systems with their existing VAX installations," notes Brian Jeffrey, director of research at International Technology Group in Palo Alto,

Such a company is Ashland Oil, Inc. The Ashland, Ky., company's coal division is currently considering the 9370 as a way to connect its IBM 370 hosts and DEC VAXs, according to information center manager Ray Parker. "We are also considering using device attachment control units, but we hear that the 9370 may be more efficient and cost-effective," Parker says.

Device attachment control units are intelligent interfaces that can be software-

configured to provide protocol conversion between an IBM 370 host and other communications environments in particular, the Ethernet area networks (LAN) running TCP/IP that are in wide use at scientific and engineering firms.

'When IBM is bidding on a contract with a company that already has a big installed base of Hewlett-Packard or DEC, it sends in its Connectivity Multivendor Center people from Atlanta," Jeffrey says. "Like a SWAT team, they provide whatever connection is needed through the device attachment control units.

The 9370 provides the same connectivity, but through expansion boards that are far less expensive and easier to install than outboard box solutions such as device attachment control units and 3720 and 3725 communications controllers, McCauley claims. Users can interface a 9370 with differnetworking environments by implementing subsystems consisting of a communications processor and different combinations of adapters that fit directly into expansion slots.

telecommunications subsystem supports asynchronous, bisynchronous and Synchronous Data Link Control connections over telecommunications lines.

The ASCII subsystem enables terminals to run ASCII applications on a 9370 supporting IX370, IBM's version of Unix, and operate printers and plotters on the host. It also converts ASCII terminals to 3270 mode, allowing

them to run VM applications and use the 9370 as a gateway to applications on other SNA hosts

Both the IBM Token-Ring and Ethernet 802.3 LAN sub systems will support TCP/IP when they are released in third-quarter 1987. "This third-quarter 1987. "This will enable multiple 9370s and RT Personal Computers. as well as non-IBM processors supporting TCP/IP, to communicate over either Ethernet or the Token-Ring," McCauley says.

The adapters also provide a direct link to a LAN, com-pared with other 370 hosts that require a communications controller or network control processor to act as an

The direct network interface also enables multiple 9370s running VM/VTAM to communicate directly over a LAN, McCauley says. "With multiple 370 hosts attached via outboard controllers, you just have workstations talking to hosts over the net-work," he adds.

"This is the first time that IBM has built communica-tions with non-IBM systems into one of its host operating systems," Jeffrey notes.

The 9370 introduction also includes Transparent Services Access Facility (TSAF), a software program that handles VM communications functions and allows transparent access to SQL data bases on up to eight hosts.

Sperandio of Blue Cross/ Blue Shield admits he is interested in the 9370's enconnectivity hanced tures. "I'd have to see them in action before I decide how useful they are," he conclud-



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# Users struggle toward unified OA network

By Mitch Betts

WASHINGTON, D.C. - Information systems managers attending an office automation show last week said they were struggling to find ways to tie complicated, multivendor systems into a single OA system.

Reynold A. Lawyer, network manager for C&P Telephone Co. in Silver Spring, Md., said he attended the jointly held National Office Automation Conference and Federal Office Automation Conference in hopes of finding vendors that could link his new Digital Equipment Corp. VAX 8650 with systems from Data General Corp. and Wang Laboratories, Inc.

"I've found people who could do one or the other, but not both," Lawyer said. "I'm trying to sell my management on using DEC's All-In-1 as the main OA system, but first I've got to prove to them that it can talk to

DG and Wang," he added.
William H. Conklin, a project manager for Merck & Co.'s pharmaceutical labs in Elkton, Va., said he is leaning toward a Hewlett-Packard Co. HP 3000 for a remote OA system but first must ensure that it can be linked to Merck's corporatewide Wang electronic mail system.

Users at the show criticized IBM's OA strategy as a confusing array of incompatible lines.

One VAX user, Francis J. DeHoratius, director of administrative computing at St. Joseph's Preparatory School in Philadelphia, said he selected a VAX 750 instead of an IBM product because DEC officials were willing to locate a vendor with the appropriate administrative software and would locate similar user sites.

guess IBM figured we were small notatoes, because they weren't interested in finding us software," he

# After changes, delays, Wang rolls out Laptop

# Greatest benefit seen in terminal functions

Wang Laboratories, Inc. last week finally announced the Laptop computer it has been showing to selected users last summer.

The 1414-lb unit, which will cost more than \$4,000 in any configuramore than \$4,000 in any configura-tion — with modems, communica-tions and application software — contains an internal 10M-byte fixed disk, a built-in near-letter-quality printer and a full-size keyboard with programmable function keys. The Laptop is manufactured by Brothers Industries Ltd. in Japan and runs under Microsoft Corp. MS-DOS 3.2.

The Laptop will probably sell well to Wang's established customer base. predicted Vincent Flanders, associate editor of Access 86, a magazine for Wang users. Users who have seen the machine say it is function-rich but Flanders said. showed the unit to users last summer as part of its market research. The results of user input delayed announcement of the machine so the company could incorporate features it wanted, Wang said.

"The system will sell as an addition for Wang's installed base of customers or as a freestanding system that will be compared to all the other laptops out there," said Charles Casale, executive director of the Boston-based Yankee Group's financial division. As the former, it is not overpriced, but as competition for the freestanding units, it is, he said.

The unit will not have a significant impact on Wang's financial health, he predicted. "This is not the home-run product that Wang needs. It's a single base hit product. It is good news for Wang, but not out-standing," Casale said. Although the basic unit costs

\$3,530, many of the features needed

to make it a useful portable machine are optional. Adding an internal mo-dem costs either \$425 or \$795 depending upon whether the user chooses a 300/1,200 bit/sec. or a 300/1,200/2,400 bit/sec. unit

Wang Systems Networking with point-to-point transfer costs \$400: Wang's Integrated Word Processing adds another \$385. Diskette drives cost \$365 for a 360K-byte drive and \$518 for a 720K-byte option. A memory expansion card to double the main memory costs \$695, and any software needed other than the Basic ecutives, who use the system for shorter periods of time. "I can pull the screen off the Laptop and plug it into a high-resolution monitor on my desk, and I can print out on the VS system's printer instead of the inter-nal one," he added.

Wang is working with major software vendors such as Ashton-Tate, Autodesk, Inc., Lotus Development Corp. and Oracle Corp. to develop Software Solution Sets — groups of application software packages that include Wang core and distributed software packages that meet particu-

Vang laptop asic configuration: \$3,530

Microprocessor: NEC V30 16-bit CMOS

ory: 512K bytes

Storage: 10M-byte internal hard disks

Power: Battery pack, AC adapter

Printer: 18 char./sec. burst mode



language is additional.

The additional costs are not a problem for one of the unit's first users, said Art Rushing, regional director of finance at the U.S. Postal Service, Southern Region, in Memphis.

"We have been pushing Wang to come out with a portable that has all the functions of a Wang PC, and we are elated with the Laptop. You have to weigh price against functiona-lity," Rushing said. The Postal Service Laptops will interface with his VS systems, act as VS workstations and allow Rushing to redeploy some of the bigger workstations to staff members who use them six or eight hours a day.

According to Rushing, the Laptops will be especially appropriate for ex-

lar user needs.

Off-the-shelf products like Lotus's 1-2-3 spreadsheet will run on the Laptop, but if the customer needs 1-2-3 plus Wang word processing and other specific packages, Wang will either put together or help the customer put together everything he needs, according to Paz Kahana, senior marketing manager for desktop systems.

The Laptop, available in late November, is targeted to mobile professionals such as field personnel engaged in customer and client contact. Wang is selling the unit through di-rect distribution channels and not through its OEMs or value-added re-

The Laptop includes 512K bytes of random-access memory, expandable to 1M byte, a 25-line by 80-character supertwist LCD screen and 16 function keys that, when shifted, provide 32 functions. Supertwist LCD is a technology that enhances the mechanism that handles reflections on the screen, Kahana said. Users can access Wang or IBM software from the same menu, a spokesman said. The Laptop connects to Wang's VS, OIS and PC products and can emulate Digital Equipment Corp.'s VT100 or IBM's 3270 terminals.

"If I were a Wang customer, I'd use it as my permanent machine that I can move around," Casale said. Not having a built-in floppy disk drive is not a liability because the 10M-byte internal drive will handle all systems and some applications software, he

For the Postal Service, the built-in printer is extremely important, especially to Postal Service auditors, who will be able to prepare and leave comments and observations at the work sites they travel to. Rushing said.

The need is for one or two pages so the slow speed is not a problem," he said. "I have observed a number of laptops, but it takes a 25-lb briefcase to carry the peripherals on most of them. That would include a printer, the acoustical interface [modem] and one or two external disk drives. This unit is self-contained," he said.

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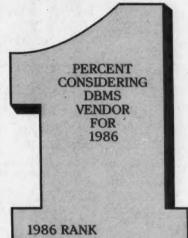
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SOURCE: 1986 Software User Survey\*

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	Newport Beach . Sep 25, Nov 11
	Sacramento Jul 22,
	Sep 18, Oct 30
	San Diego Aug 7,
	Oct 7, Nov 6
	San Francisco Aug 5, Sep 9,
	Oct 14, Nov 6, Dec 9
	San Jose Aug 7, Sep 23.
	Oct 21, Nov 13
	Denver Sep 18, Oct 21, Dec 10
CT	Hartford Sep 10, Oct 22,
	Nov 13
	New Haven Aug 20,
	Oct 8, Dec 4

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	Orlando		
	Tempa	Market Street	Aug 6
GA	Tampa Atlanta Columbus .	Sep 23	Nov 6
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ID	Boise	bul 21	Sec 11
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284	Chicago	ct 9, Nov 5,	Dep 10,
IN			
124	Indianapolis		
760	100.634	Oct 15	Dec 3
KS	Wichita		. Sep 4
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LA	New Orleans		
MA	Boston		
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	Burlington .		Aug 12
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	Iselin Jul 22, Sep 16, Oct 9,
	Oct 30, Nov 13, Nov 20
	Princeton Sep 25
NM	Albuquerqua Sep 16, Dec 10
NY	Albany Jul 23, Sep 11, Nov 20
	New York City Jul 24, Aug 12,
	Aug 26, Sep 3, Sep 17, Oct 2,
	Oct 22, Nov 6, Nov 25, Dec 9
	Rochester Aug 13, Sep 9,
	Oct 15, Nov 18, Dec 10
	Syracuse Aug 19,
200	Oct 21, Dec 16
OH	Akron Jul 23

	Cincinatti Aug 5, Oct 21
	Cleveland Jul 22,
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	Columbus Aug 12,
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	Harrisburg Nov 6
	King of Prussia Jul 24
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	Scranion Aug 5
SC	Charleston Oct 7
TN	Memphis Sep 18
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	Austin Sep 18, Nov 6
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	Houston Aug 19, Sep 11
	Oct 16, Nov 20, Dec 4
	Lubbock Oct 2
	San Antonio Aug 27, Nov 5
UT	Salt Lake City Aug 6, Sep 16
	Oct 7, Dec 4
VT	Burlington Aug 6
VA	Richmond Sep 10
WA	Seattle Oct 23, Dec 11
WI	Milwaukae Sep 9, Nov 13

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# DEC soars. IBM struggles

focused in the fastest growth area of the industry," said Jay Stevens of Dean Witter Reynolds, Inc. "Even IBM, in its 9370 announcement, identified that as the highest growth sector. But IBM still derives the largest part of its business from mainframes, which are very slow right now."
Mainframe vendors Amdahl Corp.
and Honeywell, Inc. also reported
slow quarters (see story page 142).

Stevens said that trend is even more pronounced in overseas mar-kets, where IBM's strong sales have been slowing while DEC's continue to improve. "The installed base in Europe, for example, does not have the preponderance of large mainframes that the U.S. does," he said. "The largest companies are much smaller than in the U.S., and the size of their computers follows suit."

Although IBM is shifting a large percentage of its hardware revenue from rentals to sales, it still suffered a 0.7% drop in revenue from sales. Rental revenue fell 35% from year-earlier levels, while revenue from services grew 20%.

Net income dropped to \$1.08 billion, or \$1.76 per share, from \$1.47 billion, or \$2.40 per share, in the third quarter of 1985. IBM's ninemonth earnings are lagging 12% be-

hind last year. and Big Blue is certain to record its secannual decline in profits for the first time since the Depression.

IBM's fortunes. moreover, are not likely to turn around in the future. near Recent midrange product introductions an unprecedented corporate cost-cutting campaign are

expected not to impact the bottom line until at least the middle of 1987

They should be in a good position to capitalize on an economic improvement, but no one can figure out when that will come," said Drexel Burnham Lambert, Inc. analyst Labe. "Right now they're Peter they're going through a tough period in capital spending at the same time they're trying to get

their product act together." DEC, for its first fiscal quarter ended Sept. 27, posted earnings of \$182.6 million, or \$1.37

per share. compared \$72.3 million, or 60 cents share, in the year-earlier period. Oversales assed the \$2 billion mark for the first time at \$2.04 billion, up from \$1.62 bil-

in the

first quarter of fiscal 1986. 'The story behind DEC is market share gains in the middle range, at the expense of IBM and others," said Marc Schulman of Salomon Brothers, Inc. "It is DEC that is getting the li-on's share of new applications in companies that are bringing them up,

lion

particularly in networking. Schulman also cited the improve-ment in DEC's gross margins (the difference between a firm's pretax revenue and its costs). That margin reached 49.6% in the quarter, up roughly 10% in the past year, thanks to higher margin VAX systems replacing PDP-11s and lower produc-tion costs. "That improvement is nothing short of extraordinary," Schulman said.

IBM, by contrast, has higher margins than DEC's, but they are declining. "IBM's projected industry growth rate has been too high," Dean Witter's Stevens said. "When a company projects too much revenue, it winds up in an earnings squeeze, and that has happened."

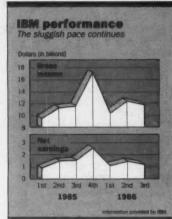
An IBM spokeswoman said the

year-to-year earnings drop was IBM's largest since the Federal Ac-counting Standards Board required firms to restate their earnings in

Krowe, a senior vice-president, will be in charge of the Information Systems and Communications Group, the unit that includes personal computers, workstations and networking communications, and the Information Systems and Products Group, which includes mid-range computers, low-end storage products and finan-cial systems and peripherals.

"They want a more senior manage ment focus in those areas," IDC's Hart said. Krowe has gone from the corporate office with a staff of about 100 to critical line management with responsibility for tens of thousands.

The two units formerly reported to Vice-President Jack Kuehler, who retains responsibility for the storage and systems technology groups.



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# NCR beats 'who's who' of vendors for \$20M Hutton PC deal

# Will ship 10,000 units over next two years

By Alan Alper NEW YORK — E. F. Hutton & Co. last week disclosed that it selected NCR over a veritable "who's who" of computer systems vendors to supply it with 10,000 IBM Personal Computer AT-compatible workstations over

the next two years.

The NCR-supplied color workstations will replace the decade-old Bunker-Ramo L dumb terminals on Hutdesks, providing brokers' access into the firm's corporatewide information network. Hutton said it is purchasing the workstations at a cost of \$20 million, which includes installation and service.

NCR formally unveiled the work-station it is selling to Hutton at a press conference held at the brokerage's headquarters here last week. Called the 3390, the AT-compatible workstation makes extensive use of very large-scale integration and surface-mount technology and features 3½-in. disk drives, which enabled NCR to design a microcomputer with a small footprint, the firm said.

Hutton said it would begin testing the 3390 workstation during the first quarter of next year and would conduct a pilot program at the branch level the following quarter.

## Domestic, Japanese, European vendors

While declining to identify what firms competed with NCR for the contract, Richard P. Rittereiser, Hutton president and chief operating officer, said the Dayton, Ohio, firm was chosen over a number of domestic, Japanese and European vendors. Sources said that while firms such as AT&T, Data General Corp. and Wang Laboratories, Inc. initially vied for the contract, NCR won out over Hewlett-Packard Co. and IBM, which bid

an unannounced product.

Charles Exley, NCR's chairman, last week credited the winning bid to 'having a product that in terms of timing and functionality fits perfectly with what Hutton wanted.

While some analysts have continually questioned NCR's participation in the personal computer business, Exley said the Hutton contract "is yet another validation of the correctness of a strategic decision made several years ago to make a major in-vestment in personal computing technology."

Disclosure of the winning bidder was expected to be made by Hutton last month but was delayed at NCR's request, noted Bernard Weinstein, Hutton's vice-president of communications, branch information systems and programming. "We wanted to

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make the announcement earlier but NCR was not ready to release the product," Weinstein said.

The NCR workstation, which Hutton has customized and dubbed Advanced Workstation for the Executive (AWE), is the culmination of the brokerage's decade-long attempt to create a single network that can be accessed by all its brokers [CW, Aug.

The network's four-tier architecture includes four IBM 3080 and 3090 mainframes in New York, 40 DG Eclipse minicomputers at its regional offices and a DG MV minicomputer in

each of the firm's 400 branches.

By using AWE, brokers can extract a wide array of real-time and

historical data on a multiplicity of securities, which can be displayed in a variety of colors, layouts and formats. The workstation can also access financial information services, such as Dow Jones News/Retrieval.

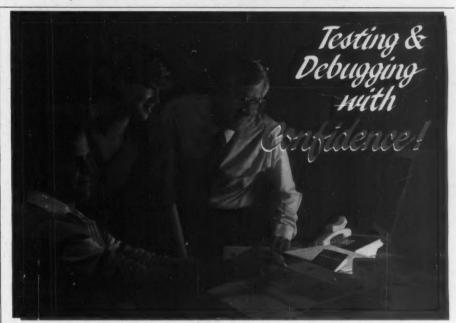
AWE reportedly runs the full gamut of applications software that is compatible with Microsoft Corp.'s MS-DOS. It also has been customized to run DG's CEO office automation software, which provides word processing and electronic mail, among other capabilities.

NCR said its 3390 workstation can be arranged in a variety of configurations through the use of "personality cards," which provide video, disk drive and device controllers as well as memory expansion on a single board.

The 3390 is designed around the Intel Corp. 80286-10 microprocessor, which operates at 6 or 10 MHz, and runs NCR-DOS, the firm's MS-DOScompatible operating system.

The workstation can be connected to local-area networks or directly attached to departmental or mainframe computers.

Three versions are offered: a diskless model, priced at \$1,694, for networking applications; a single 720K-byte floppy unit, priced at \$1,804; and a 20M-byte hard disk version priced at \$2,789. Deliveries are expected to begin in November, NCR said.



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#### **NEWS**

# User claims Cobol generator allows cooperative processing

# Says IBM mainframe, PC applications tied

By Charles Babcock CAMBRIDGE, Mass.

- A user of a Cobol application generator from the Computer Corporation of America (CCA) recently said the product opens the door to cooperative processing between applications on IBM mainframes and those on IBM Personal Computers.

Cooperative processing among in-terdependent applications on different processors has been a stumbling block for data processing departments for many years because of the lack of ways to overcome incompatible operating systems.

CCA has written an IBM PC version into Release 5.0 of Accolade, a mainframe application generator; this version may be used to develop applications that can run on the PC or be transferred to run under CICS on the host.

By using Accolade, a Cambridge software house has both off-loaded its CICS application development to IBM PCs from its time-shared mainframe and developed software with cooperative processing features.

Cooperative processing readires.

Martin Flusberg, president of
Multisystems, Inc., an applications
software house, said Release 5.0 has
a built-in file server that allows the

automatic transfer of files between applications running on a PC and a host. He added that Multisystems has been using Release 5.0 in various forms for a year.

In a project management applica-tion, Flusberg said, a project manager may request files on a particular project, have them delivered to his PC, work with them and return them to the mainframe host without issuing any commands to the mainframe base. An application on the mainframe similar to his PC software processes his request for the files, making sure he has the proper security clearance, and downloads them.

The file server capability makes it very easy to move things between applications," Flusberg said.

In another application under development, Multisystems will aim to make it possible for truckers to enter freight data at remote sites by having their shipments checked against a central data base. If freight is transferred to another trucking firm and the fee is split, local data entered on an IBM PC will record the point of transfer and calculate the revenues for each, Flusberg said.

The results of the data entry and calculations will then be uploaded to a mainframe host, where additional processing will record the shipment and calculate the bill to be sent to the

shipper

The local data is used for a multitude of other purposes" by being processed through an application on the mainframe that is similar to the one used on the PCs in the field, Flusberg

"For my money, Accolade offers a building block to cooperative pro-cessing," said Vaughan P. Merlyn, an application development consultant in Marietta, Ga.

Merlyn said there are few cooperative processing applications in use through Accolade, which has a limit-



'Shops are not sufficiently sophisticated in their thinking to make use of cooperative processing.'

Vaughan P. Merlyn application development consultant

ed installed base of about 100 customers, or through any other prod-uct, because "shops are not sufficiently sophisticated in their thinking to make use of cooperative processing."

With its ability to generate CICS Cobol applications on either the mainframe or the PC, Accolade will be primarily used for off-loading de-velopment tasks from the mainframe, Merlyn predicted, but cooperprocessing remains possibility as soon as developers seize on it.

"It's a first step toward coopera-tive processing," he added.
Richard Winter, CCA vice-presi-dent, said the PC version of Accolade Release 5.0 comes as a \$7,500 option. The mainframe version is priced at \$65,000 to \$135,000, depending on operating system and options. Both will be available Dec. 1.

Release 5.0 allows a user to specify, generate, compile, test and inter-actively debug and execute CICS/ VSAM applications on an IBM PC. The same applications can be run on mainframes using MVS and DOS/VSE at both specification and source code levels, Winter said.

Release 5.0 includes a dictionary link that allows Accolade applications to use data definitions stored in a Model 204 dictionary, according to Winter.

In addition, Release 5.0 features an SQL interface for accessing IBM's relational data base management systems, DB2 and SQL/DS.





# Sony exits UK

LONDON — Sony Corp. has pulled out of the UK microcomputer market, even before its new SMC 210 syseven tem began shipping. The company has cancelled all marketing plans, blaming the value of the British pound against the Japanese and "the ever downward spiral of market prices.

The conditions, according to a Sony spokeswoman, have forced us to the conclusion that the basic personal computer market does not represent a profitable activity either for Sony or its deal-

But sources close to Sony feel that the company's withdrawal is not a permanent. one. The cancellation of its plans have been put down to supply problems in Japan rather than concern over UK prospects.

The company's spokeswoman said she could not comment on the machine's future in overseas markets.

The company's reluctance is also thought to be tied to recent market development reports. Sony is facing a market that has quickly become dominated by Toshiba Ltd.

Sony plans to concentrate future efforts on existing micro-based product lines, such as interactive video and office automation products, according to a spokesman.

# DEC smiles on sub

MUNICH. West Germany Following a 20% growth in its West German sales, Digjecting \$22.5 million into its West German subsidiary ital Equipment Corp. is in-German subsidiary, thereby increasing its capital stock in the firm to \$42.5 mil-

# British force upped

READING, England — Digital Equipment Corp. will add 970 new jobs to its British facilities by the middle of next year, bringing its total work force here to around 6,700 by June.

The job additions will be primarily in the areas of sales, field service and software engineering, a spokesman said.

The company's UK headquarters here will gain 400 employees and another 160 will be recruited for DEC offices in Basingstoke. The London facilities and the plant in Ayr will both in-crease by 100 people.

# Philippine project

SEOUL, South Korea Daewoo Telecom Co., a subsidiary of The Daewoo Group, has signed a \$24 mil-lion deal with the Philippine government to supply TDX-1 digital telephone switching equipment.

The agreement calls for Daewoo to install the equipment, which will total 40,000 subscriber telephone lines, over a two-year period.

# ICL lands contract

LONDON — International

# Computers Ltd. (ICL) has beaten IBM to a local govern-

ment contract right on Big Blue's British doorstep. ICL recently won the hardware and software contract from Winchester City Council amid fierce competition from both IBM and Honeywell, Inc.

IBM's laboratories are based in the area, and several IBM employees sit on the town council.

IBM local councilors were forced by local legal requirements to declare an interest and leave the council chamber when the vote on suppliers was taken.

The council currently runs a Honeywell DPS 6 minicomputer for office automation applications and has an agenagreement with Hampshire County Council to run applications on the county council's IBM mainframe. Winchester has opted for an ICL Series 39 Level 30 mainframe running ICL's Quick

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# Javelin price slashed

By David Bright
CAMBRIDGE, Mass. — In a drastic bid for increased marketing presence, Javelin Software Corp. last week temporarily slashed the price of its Javelin financial planning and reporting package from \$695 to \$99.95

The promotion will end as soon as 10,000 packages are sold at the lower price, said Bonzagni, Javelin's ting vice-president. marketing Since Javelin started shipping the financial package a year ago, only about 15,000 units have been sold, Bonzagni said.

While claiming that the highly rated software pro-gram has gained many "zealusers, Bonzagni acknowledged that Javelin faces an uphill battle in building public awareness of the software. "We're caught in somewhat of an inertia bind. We have to break through and get some critical mass," he declared.

Although Javelin's bold

move will help the package gain momentum, it will still be difficult to make inroads against Lotus Development Corp.'s best-selling 1-2-3, noted Bonnie Digrius, director of software research at Input, a Mountain View, Calif., market research company.

Bonzagni contended that Javelin is by no means meant to be a replacement for spreadsheets; rather, it is a tool for specific applications such as forecasting and ad hoc analysis. In fact, most Javelin users already own spreadsheets, he said. But although the target audiences for 1-2-3 and Javelin may not be identical, most users do not want two packages, Digrius said.

Claiming it had expanded direct sales costs too quickly, Javelin last August laid off approximately one third of its three dozen employees. The 31/2-year-old company is backed by more than \$4 million in private funds.

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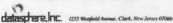
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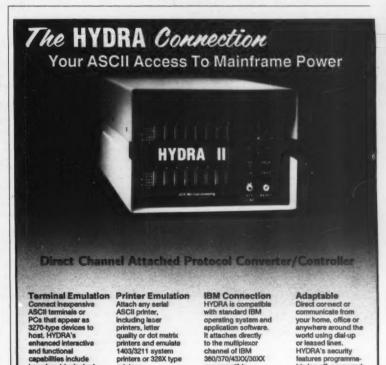
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#### **EDITORIAL**

# Let buyers *beware*

Last week the MIS community read yet another chapter in IBM's year-long tale of financial woe: Third-quarter results fell nearly 30%, making it likely that the world's largest computer maker will show a drop for all of 1986 and thus, for the first time in over half a century, show two successive years of earnings declines.

Some argue that this is one more bit of evidence that we are in the early stages of a his-toric transformation in the computer indus-try itself, one which will result in computers-as-commodities and an industry that resembles today's consumer electronics

Not surprisingly, IBM instead blames its fate on external factors — among them a slowing global economy, sluggish capital spending and increased industry competition and looks to the second half of 1987 for relief

But right now, before either of these contentions can be proven true, IBM must deal with a dramatic turnabout in its fortune The question now before MIS is how IBM's current efforts to cope with its lowered expectations will affect computer-using organi-

Will this dominant company become more stable or less so? Will its efforts to cope with an increasingly competitive market lead to greater leverage for buyers or to greater risk, as product cycles set in motion several years

ago are significantly changed or disrupted? Clearly, pressures on IBM to increase revenue will result in at least short-term advantages for computer users — at minimum, in negotiating more favorable terms in acquisi-tion agreements. Also likely are improved hardware price/performance ratios. According to industry scuttlebutt, an announcement is imminent on a tune-up within the 3090 family. Such improvements — if easily accomplished with existing machines — would do no damage to IBM's installed base, while it would provide users with the clear differentiation they have been seeking between the 3090 and the older 3080 family.

Just as clearly, however, those same revenue pressures could work against the best interests of users, should they push IBM into rushing new products to market - products that may be ill-conceived, underdesigned and inadequately tested. Already there are rumors of quick additions to the 3090 family above the four-CPU Model 400.

While MIS must be quick to push its shortterm advantage in a competitive marketplace, it must also be quick to reject efforts — IBM's or anyone else's — to gain market share at the expense of healthy, long-term product development. MIS must be vigilant in its efforts to guarantee that IBM and its competitors do not sacrifice performance, reli-ability and deliverability for a short-term gain. The advice of the moment, therefore: Proceed, but with caution.



#### LETTERS TO THE EDITOR

# Use existing AI systems for the PC

In response to your recent editorial, "The next revolution" [CW, Sept. 15], I cannot help but fully agree with your assertion that artificial intelligence has a vital role in business and commercial applications.

However, where you extol MIS professionals to apply pressure for artificial intelligence systems development based upon tried high-level lan-guages, such as Cobol, I would strongly recommend the use of existing products. Waiting for a Cobol-based inference engine to come on the mar-ket will put the MIS manager far behind those who turn to currently obtainable products for the per-

Artificial intelligence packages are already available for building expert knowledge systems with natural language interfaces that are coupled with the familiar tools of data base, spreadsheet, report generator and text editor.

Foremost among these trendsetting software applications is Micro Data Base Systems, Inc.'s Guru, a fully integrated package that has all the usua! tools of automated business management plus such artificial intelligence features as data base, spreadsheet, text editor, graphics, report generator, command language, telecommunica-tions, natural language and expert knowledge sys-

It is very similar to Knowledgeman, with identical file structure and corresponding menus. Guru's inference engine supports backward and forward chaining, displays how and why it arrived at a particular recommendation and is capable of accessing information from any other subsystem, whether program file, data base or spreadsheet. The menu-driven interface permits the novice knowledge engineer to quickly design rule sets and begin using artificial intelligence productively.

There are other products available: Quick Start by Teknowledge, Inc. and Impact/AE by Distribu-tion Management Systems, Inc. I have yet to see these products and cannot offer an opinion.

When Impact/AE becomes available for the IBM Personal Computer next year, a Cobol-based ex-pert knowledge system for microcomputers will be a reality. Those of us using Guru, however, will have had a full year of applications developm experience.

Karl Horak, Ph.D. **Computer Consultant** Albuquerque, N.M.

# **Cullinet on departmental computing**

Your recent article, "Vendors take opposing tacks to departmental computing" [CW, Sept. 29], may have left an incorrect impression regarding Cullinet Software, Inc.'s strategy for support of departmental computing.

While attention has recently focused on our announcement of support for Digital Equipment Corp.'s VAX architecture, we are committed to delivering cooperative processing software horizonlivering cooperative processing software normalitally across, and vertically between, mainframes, minicomputers and microcomputers. Vertical cooperative processing can be seen in the micro-to-mainframe and mini-to-mainframe products we offer today. Horizontal processing will be offered through the distributed data base products to which we committed in our Blueprint briefing.

Robert E. Barr Director of Product Marketing Cullinet Software, Inc.

While we are certainly pleased to have our new departmental computing strategy noted by your Sept. 29 report, it is inaccurate to view our Digital Equipment Corp. VAX thrust as being at odds with the unfolding scenario of networked personal computers linked to the corporate mainframe. Cullinet has an established and successful PC-to-mainframe business. In fact, we are substantially upping our investment in this arena as we are rolling out the VAX strategy. We believe the departmen-tal machine, specifically the VAX, will be the cornerstone of departmental computing. We also believe that end users need PC-based access to data stored on larger computers and the means to analyze and report on that data from PCs.

Stephen B. Sayre Director of End-User Products Cullinet Software, Inc.

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Letters should be addressed to the Editor, Com-sterworld, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

# VIEWPOINT

# Avoiding risky business: Software buyer, know thy needs

wo investors recently bought a software firm. They soon discovered, with 50 customers signed up, that its vaunted new product existed largely in the minds of the firm's managers. These managers, meanwhile, were looking for new jobs as fast as they could.

When asked why they didn't speak to any of their customers, their answer was simple: It wouldn't have done any good. The product was scheduled to ship shortly after the deal was closed. Before that time, what would customers say, "We don't have it yet, but we didn't expect to have it yet and it looks good on paper'

Why didn't they check test sites? There were none. Not good practice, but not unheard of in small firms. They planned to "limit early shipments to a rate where we can get the bugs out." The customers at the head of the list knew the score in this respect.

What about demos? They saw one. The functions that had also been in the firm's earlier products worked. The menus listed the new goodies. Since the investors didn't know what was new and what wasn't, much of what they (and their consultants) tried worked. The few times something wasn't there, they were put off with, "We're replacing that module" "It's scheduled for next week's integration step."

So far, we have two investors who are out a bunch of money. In this case, they can afford it. But the issues run deeper. If two hard-nosed businessmen can be duped, what about the rest of us?

First the bad news. We are all "vaporware" targets. Most vaporware does not arise out of malice; it arises

from optimism. Typical developer states of mind include "It will work by then," "It's a trivial data structure, or "I can code it in a week if anybody orders Ha. Rome wasn't built in a day. Neither is ROM or RAM. Most products do work sooner or Usually Sometimes much later.

This being the case, what should you do? Cas-

par Milquetoast would give you one answer: Don't go near anything less than three years old without speaking to a hundred happy users. Fine advice if you wear a belt plus two pairs of suspenders and don't leave the house when it's raining. But some of us do need current products.

The first step you should take is to

uct will really do your organization some good and achieve some result that can't be achieved as well in any other way? If it's any reason but the last, call Software Buyers Anonymous. Someone will come over and talk to you until the urge to buy software goes away

Next, look at the risk of using the product. A personal computer slidemaking program may cost \$150. If it's a dud, you're out \$150 plus the time someone wasted in finding out it's a dud. But your corporate data

base is still intact, no customer orders have been lost and nobody has been laid off because the package lost a digit in net profits. When your vulnerability is small, take chances. When its large, you have to be careful.

Being careful is large ly a matter of common sense. If a package has been delivered - even to

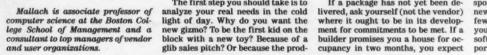
test sites talk to users. Ask rough questions. Use the package as much as you can under the conditions. Don't take no for an answer from the sales rep; make it clear that yes is a condition of purchase. While you may not want to do without the benefits of a new capability, you do want to avoid the problems defective software can create.

If a package has not yet been dewhere it ought to be in its developto see some construction at the site. If occupancy is to be in two weeks, the house should be complete except for paint and trim.

It's the same with software. Based on your assessment of what its state ought to be, get proof that it has reached that point or better. "Proof" means just that. If you don't think you're capable of assessing the software yourself, get someone who is. (The investors of the first paragraph failed this test. Their consultant was a financial type with a background in the industry the software firm served. He did not have the technical background to see through the misrepresentations.)

A package may fail these tests and still be desirable because of its potential value. Or it may pass them and still not do what you expect when you expect it. Your final protection is to ask, "What can go wrong?" Mur-phy's Law will apply. Protect yourself by planning what you will do if a new package fails to perform as expected. View these contingency and backup plans as an insurance policy that you hope you won't need but still won't go without.

Bottom line: There is a time to buy new software packages. Were there not, no new company could ever get started. But, as a manager whose responsibility is to your employer, use new software with care. Taking a few intelligent precautions will give you the benefits of state-of-the-art software with little exposure to va-



# How desktop publishing went from accident to application

**GUEST OPINION** 

By MICHAEL A. CONNIFF

By EFREM MALLACH

s the designated mop-up speaker at the recent "Electronic Publishing" show in London, I was faced with the thanktask of uncovering synergy among disparate industries and technologies, from desktop and corporate electronic publishing to compact-disc/read-only memory (CD-ROM) and compact disc interactive (CDI).

Since consultants are not paid to stammer, our genetic tendency is to come up with an answer. This, then, was my answer to the question of how to "bring it all together:"

The basic principle of digital integration — the integration of voice, video, graphics, text and data is the fundamental driving force in electronic services today and will remain so far into the future.

• The simultaneous arrival of CD-ROM and electronic desktop publishing is a harbinger of the multimedia desktop workstation to come ultimate end-user communications and computing tool.

· This trend toward digital integration has reached its first manifestation in an unlikely consumer elec-"appliance" known compact disk interactive.

Let's take it from the desktop and follow the logic. Just as CD-ROM and CDI grew out of the success of compact-disk audio, so too has desktop publishing grown out of raw technical capability — on the front-end and the backside. When the Xerox Corp. designers at the Palo Alto Research Center (PARC) came up with the idea of a user-friendly mouse and icons. bit-mapped graphics, pointers and the like, desktop publishing was un-known. The improved PARC bitmapped front end — the possibility that meaningful graphics could be harnessed by

nontechnical uswas the first synergistic eye-opener this scenario.

On the back end — the output side while the Xerox developers worked on technology that would first be made commercially manifest as the Xerox Star system, and then the Apple Computer, Inc. Macintosh, laser-printing technology was begin-ning to emerge. The availability of an affordable Star-like Macintosh workstation and laser printer opened the door to desktop publishing.

So desktop publishing station or personal computer plus software and laser printer output became an application that harnessed the enhanced bit-mapped graphics of Xerox and Macintosh computers and the ability of laser printers to elegantly produce the result on paper. Desktop publishing, almost by accident, emerged as an ap-

Amidst the hubbub of Apple's print advertising blitz extolling desktop publishing, the importance of another force was largely missed. The advent of the Macintosh and desktop publishing meant that average users
— not multidegreed Computer-Aided Design/Computer-Aided Manufactur-

ing rocket scientists - were in a multimedia environment for the first time.

This development meant that users were now giv en widespread opportunity to consider graphics as information. It was a breakaway from the information society's nearly total dependence on text, on the word printed or transmitted.

The simultaneous arrival of laser printers meant users of these friendly workstations also had a warm, friendly and high-quality output paper, an end-product you can hold in your hands — which could be cost-justified as a better and cheaper way to accomplish internal tasks.

There are many other examples of multimedia data bases and information services expanding beyond raw text. The Compaq Computer Corp. Telecomputer and the Northern Telecom. Inc. Displayphone are early examples of computer/telephone workstations that may yet become commonplace. Datapoint has inte-grated video teleconferencing into some of their distributed data processing products.

Compact disk interactive, in primitive fashion, pushes multimedia integration a step further. As specified by Sony Corp. and Philips Telecom-munications N.V., the CDI standard provides for audio, still-frame video, graphics, some limited animation, text and data. The different media have been reduced to a common digital coding, though the implications remain more evident than the precise shape of applications to come. CD-ROM applications are also moving toward multimedia applications, using the laser printer for output.

It is no longer foolish to consider the manager of the future at a multimedia desktop workstation, utilizing all the media in the course of daily business - audiotex services, on-line video teleconferences, data bases. stored graphic images on CD-ROM, perhaps output to a laser printer and the plain old phone.

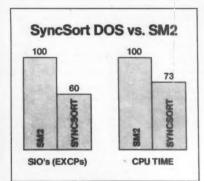
Conniff is a consultant and writer based in Burlington, Vt.

# SMART COOKIE

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- Record Formatting Powerful features like INCLUDE/OMIT, INREC/OUTREC, SUM and others — with capabilities like data conversion, editing, insertion of literals.
- Multiple Output From a single sorted file, you can create multiple files and reports. Each can include the same or different data as determined by INCLUDE, OMIT, OUTFIL or OUTREC parameters.

#### BETTER CUSTOMER SERVICE

Still another sweet advantage of SyncSort DOS: help is always there when you need it. 85% of all requests for service are resolved within 24 hours. We always rise to the occasion.

The moral to this story: smart cookies are quick to reject half-baked solutions in favor of SyncSort DOS. Call us for a demonstration. Once you get a taste you will be hungry for more.

#### SyncSort DOS

One smart cookie deserves another.

# **SOFTWARE & SERVICES**



SOFTALK

# Those busy signal blues

he problems with computer software support are so tremendous that Time magazine devoted nearly a full-page article to the situa-"The Busy Signal Predicament" recently.

The computer support problem has two major fronts — the frustrated users with questions for the manufacturers about their products, and the costliness of the user support given by the software manufacturers. Both the users and the manufacturers have valid arguments in their defense.

The users keep running into busy phone lines when trying to contact the software manufacturers for free advice via the toll-free assistance lines. And it's not just on the first or second call. The lines seem to be busy from 9 a.m. to 5 p.m., after which the phone machines will gladly answer any calls.

There are various avenues open to a user to get around these problems; how-ever, as with most things in life, they're not free. Users can subscribe to an as sortment of service contracts complete with unlisted help line numbers. The services are offered by both software manufacturers and third-party consultants. Typical fees for such services are generally less than \$100 per year.

Software manufacturers and vendors are often criticized by users for their lack of an adequate number of professionals to assist them when problems arise with their software. Yet the manufacturers often have valid reasons for the way they deal with their customers' problems. The bottom line is money once again.

The software industry spends hun-See **THOSE** page 21

Thimbault is the publisher of "AI Today," a newsletter launched at the August conference of the American Association for Artificial Intelligence in Philadelphia. He is based in Elkview,

# IBM adds high-tech VM

# System software aimed at technically advanced users

By Rosemary Hamilton WHITE PLAINS, N.Y. — Along with the recent release of its VM/SP operating sys-Along with the tem, IBM announced a number of VM-related software offerings, including a version of VM/SP targeted at technically advanced

VM/SP System Offering, which is scheduled for availability in the second quarter of next year, is based on VM/SP Release 5 and will be offered as a package with application programs. Users can select from more than 60 programs and will receive both the operating system and their programs on the same tape, an IBM spokesman said

The packaged VM/SP concept was also for entry-level users this month with IBM's introduction of VM/IS.

"VM/SP System Offering is for our larger customers or those with advanced technical skills," an IBM spokesman said.

Pricing for VM/SP System Offering de-pends on a user's choice of application programs. The operating system component price ranges from a one-time charge of \$7,740 for a small processor to \$30,950 for a high-end mainframe.
Complimenting the VM/SP Release 5 op-

erating system are the following software

 Resource Access Control Facility
(RACF) for the VM/SP environment will be available at a monthly cost of \$695 in December. Currently, users are required to purchase two software packages to run the system security program under VM/SP
— the RACF Version 1 Release 7 program
and RACF/VM Support PRPO. Combined, the two programs had a monthly charge of \$1,108.

With this announcement, the vendor See IBM page 23

#### INSIDE

IBM announces text-search capability for VM/CMS systems/21

# **NEW THIS**

- Landmark Systems Corp. releases Version 6.2 of The Monitor for CICS
- For more on this and other new products, see pp. 95-114.

#### INSTANT ANALYSIS

"Ten years ago there were a lot of software companies shooting from the hip and some of them developed Achilles' heels. Many companies are certainly much more mature today."

- John Cullinane chairman, Cullinet Software,

## SOFTWARE NOTES

# Rabbit Software to provide IBM link

IBM has selected Rabbit Software Corp. of Malvern, Pa., to provide 3270 and remote job-entry host communications for its RT Personal Computer. IBM will sell Rabbit's 3270-Plus and RJE-Plus micro-to-mainframe emulation packages. 3270-Plus includes a host programming interface that permits us ers to write applications for the RT PC that can interact with host applications.

Cummins Engine Co., a manufactur-er of diesel engines and truck equip-ment, has invested \$1 million in Aries Technology, Inc. of Lowell, Mass., as it attempts to bring to market the Conceptstation, a computer-assisted mechanical engineering design aid.

According to Cummins officials, the firm wants to use the product in the development of new products. Other investors include Alex. Brown & Sons, Edelson Technology Partners and Citi-corp Investment Management.

See NOTES page 23

# On-Line rebids E-mail in CICS

FORT LEE, N.J. — On-Line Software International, Inc., in a renewed effort to crack the electronic mail market, has unveiled a message processing system that runs in the CICS environment.

Called Bulletin, the system enables users to create and distribute memos, forms, reports and other documents on IBM 3270 terminals and microcomputers. The system can be used on IBM 370-family mainframes and compatible computers running a CICS environment under DOS or MVS operating systems, On-Line Software repre sentatives said.

Bulletin is On-Line Software's second foray into the E-mail business. The firm introduced its initial electronic mail system, Omnicom, about 31/2 years ago. Omnicom was subsequently melded with its microto-mainframe product — Link keted under the name Omnilink.

We found that the two products were viewed as different applications, so we thought we'd start a new development effort and re-enter the market," noted John C. Crocker, On-Line Software's executive vice-president.

See ON-LINE page 23



Wouldn't it be nice to have a couple more terminals on your desk?

You could eliminate the inconvenience, lost productivity, and system overhead associated with logging off and on to different applications!

EMMWNDOW permits multiple terminal sessions to be active concurrently at the same physical 3270 CRT, under DOS or OS VTAM. The user may switch back and forth instantly between the terminal sessions by hitting a PA or PF key. The terminal sessions may be in the same or in different VTAM-connected partitions/regions. For example, one session might be logged on to a CICS partition or to TSO to do program editing, and another session connected to a test CICS to test the application program being developed.

Call for full documentation or free 30-day trial.

Price: OS - \$4800 or \$200/mo., DOS - \$2400 or \$120/mo.

Bith has 15 system software products for improving productivity and use of DOS/VSE, OS, and CICS, and also performs syste programming consulting. Marketing agents in most countries.

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# **SOFTWARE & SERVICES**

# IBM announces text search capability for VM/CMS systems

# Text retrieval operates with no file conversion

WHITE PLAINS, N.Y. search capability for VM/CMS customers has been announced by IBM as an enhancement to existing CMS text retrieval functions

IBM spokesmen said Contextual Search/370, or CFSearch/370, is a

full-text search facility that can look for any textual information, such as plain words, acronyms, variables in source programs, dates and numbers.

The search may be conducted across multiple CMS files without requiring any file conversion or con-tent description. Information on us-ers' minidisks may be accessed without identifying individual files.

The search is based on full-text indexing. The indices required for searching are created automatically. Any selection of files is possible, provided the record length of a file is less than 256K bytes, the announcement said.

The search may also be based on a national language.

Text analysis tables are provided for English, Spanish, French, Portuguese, Italian, German, Norwegian, Swedish, Danish and Finnish and include adaptations for Belgium, Bra-

zil, Canada and Switzerland. When needed, the search may be conducted by partial match retrieval and the use of Boolean logic (And, Or, Not) to combine search words. The system can also look for user-defined synonyms and display the modified request to the user before proceeding with the search.

CFSearch/370 is available immediately at a one-time charge of \$6,500 or a monthly license of \$295.

# Those busy signal blues

From page 19

dreds of millions of dollars per year for customer support. The cost of customer support can be crippling. If one user makes more than two or three calls for assistance over the product's lifetime, then, in many cases, the manufacturer is paying for the customer to use the product.

Enter artificial intelligence. One way to minimize the assistance request calls is to literally furnish every software product sold with its own expert system troubleshooting software. This would be a half-step sideways and two steps up from the normal tutorials currently furnished with software programs

Expert system technology is one branch of artificial intelligence that is reaping tremendous rewards from commercialization. Why not bring the technology into every home or business in the U.S. that uses personal computers, extending manufacturer support to the end-user site? The expert systems would be extremely easy to use and would require no previous computing exerience

One alternative to this is to have a mainframe or minicomputer at the manufacturer's office with resident expert systems for all of the company's products. When a user has a question with a product, he would

call the appropriate expert system. For practical purposes, the computer would need to be able to incorporate speech processing as one of its features so that the dialogue would not necessarily have to involve any human counterparts at the company. Since commercial voice recognition products are not quite ready to handle such a feat, the pros pects for such a system within the next year or two are rather bleak.

Perhaps on-line communications between customers and the manufacturer's troubleshooting expert systems will be the forerunners of speech processing devices.

Additional consequences from utilizing any of these expert system methods to assist the users include software that is initially slightly higher priced, increased profits for the software manufacturers and vendors and greater user satisfaction.

Representatives of one software manufacturer have told me their company is preparing to implement expert system troubleshooting technology in their line of products within the next year. Software users are certain to find themselves employing more expert system technology in future customer support operations.



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#### 1986 Fall Seminar Agenda

19:45-12:15 FOCUS for D

#### 1986 Fall Seminar Schedule

Attanta, GA Tue Oct 14
Hyatt Ravinia, Attanta
Austin, TX Wed Oct 22
Stephen F Austin Hotel, Austin
Baton Rouge, LA Tue Oct 14
Embassy Suites, Baton Rouge
Bacton, MA Thu Nov 6
Boston Marriott, Newton coston Marriott, Newton Charleston, WV Thu Oct 16 Charleston Marriott Charleston, MY Tru Oct 10 Charleston Marriott Chicago, It. Tue Oct 28 Marriott Oak Brook, Oak Brook Chicago, It. Tru Nov 6 Westin Hotel, Chicago Cincinnali, OH Thu Oct 30 Hyatt Regency, Cincinnati Cleveland, OH Thu Oct 23 Charlest Aignost Marrintt nd Airport Marriott ry, CT Tue Oct 28 Danbery, CT fue Oct 28
Danbury Hilbon Inn
Detroit, MI Thu Oct 16
Michigan Inn, Southfield
Detroit, MI Tue Nov 18
Somerset Inn, Troy
Greensbore, MC Mon Oct 20
Greensbore, MC Mon Oct 20
Greensbore High Point Marriott
Hartford, CT Thu Oct 9
Stewner, Markford, CT Thu Oct 9
Stewner, Markford, CT Thu Oct 9 stin Ilikai, Waikiki usten, TX Thu Oct 9 rriott West Loop, Houston lianapolis, M Thu Oct 23 Hyatt Regency, Kansas City Knoxvitte, TM Thu Nov 6 Hyatt Regency, Knoxville Long Island, MY Thu Nov 13 Sheraton, Smithtown Los Angeles Ares, CA Tue Oct 28 Sheraton at Universal Gity, San Fernando Valley Los Angeles Ares, CA Thu Nov 6 Anaheim Hilton & Towers Minneapelis/St. Paul, MN Thu Oct 30
Minneapolis Plaza, Minneapolis
Minneapolis Plaza, Minneapolis
Minristown, NJ Tue Oct 28
Madison Hotel, Morristown
Brashville, TM Thu Oct 9
Nashville Marriott
Mew Orleans, LA Wed Oct 15
New Orleans, LA Wed Oct 15
New Orleans Marriott
Mew Yerk, NY Thu Oct 30
Vista International, New York
Omaka, NE Thu Nov 6
Red Lion Inn, Omaha Thu Oct 30 Omaha, ME Thu HOV o Red Lion Inn, Omaha Orlando, FL Tue Nov 18 Hyatt Orlando, Kissimmee Philadelphia, PA Wed Oct 15 Hershey Hotel, Philadelphia Phoenix, AZ Tue Oct 21 Chestins, Scottsdale Resort Phoenix, AL 106 Serial Reso Sheraton Scottsdale Reso Portland, OR Tue Oct 21 Alexis Hotel, Portland Richmond, VA Tue Oct 7 Alexis Hotel, Portland
Richmond, VA Tue Oct 7
Richmond Marriott
Satt Lake City, UT Tue Nov 25
Satt Lake City Marriott
San Antenie, TX Tue Oct 21
Hyatt Regency Riverwalk, San Antonio
San Diego, CA Thu Oct 30
Sheraton Harbor Island West, San Diego
San Francisco, CA Thu Nov 20
Sheraton Hazee Hotel, San Francisco
Seattle, WA Thu Oct 23
Four Seasons Olympic, Seattle Four Seasons Olympic, Seattle St. Lewis, MO Thu Nov 13 Stouffer Concourse Hotel, St. St. Louis, MO Tru Nov 13
Stouffer Concourse Hotel, St. Louis
Syracuse, NY Wed Oct 15
Syracuse Marriott
Tallahassee, Ft. Tru Oct 23
Tallahassee, Ft. Tru Oct 23
Tallahassee Hitton
Weshington, DC Fri Oct 31
J W Marriott Hotel, Washington

Calgary, AB Thu Oct 30 Silyine Hotel, Calgary Heatrest, PQ Wed Oct 15 Le Centre Sheraton, Montro Ottawa, OH Tue Oct 14 Westin Hotel, Ottawa Torestia, OM Mon Nov 3 Holiday Inn, Toronto Wascowere, Se Tue Oct 28 Westin Bayshore, Vancouver

#### **SOFTWARE & SERVICES**

# IBM adds high-tech VM

From page 19

has merged the functions of the two programs into RACF Version 1 Release 7.1. Users who wish to obtain the security program prior to December can purchase the two separate packages. For this intermediate period, the RACF Version 1 Release 7 will be reduced to \$695 per month from \$841, bringing the total monthly charge to \$962. The RACF/VM Support PRPO product will continue to sell for \$267 before it is discontinued in December.

The VM/Remote Spooling Communications Subsystem Networking Version 2 Release 2 is offered as a networking utility for both IBM's Systems Network Architecture (SNA) environments and non-SNA environments. With prices starting at \$3,600, the program supports IBM's advanced-function printers, such as the 3800-3 and 3820. It also provides automatic link management, which allows the software to automatically answer an incoming call on a switched telecommunications line from a remote workstation or to automatically all a remote workstation.

matically call a remote workstation. For its entry-level VM/IS package, the vendor announced the VM/IS Productivity Facility Version 2, which reportedly offers a simplified user interface that "reduces the skill required by a system administrator to perform complex tasks," according to IBM.

The entry-level VM/IS package, which comes with a one-time charge ranging from \$900 to \$3600, is currently available.

# Lovelace Award winner named

NOTES from page 19

Margaret Hamilton is this year's recipient of the Augusta Ada Love-lace Award for Excellence, awarded by the Association for Women in Computing, Hamilton, a mathematician, directed the 300-member software engineering team that created the on-board guidance and navigation software for the Apollo spacecraft program.

Quintus Computer Systems, Inc. of Mountain View, Calif., will develop a run-time version of its Prolog for IBM 370-family mainframes running VM and MVS. The effort results from an agreement with Language Technology, Inc., which will develop programs in Quintus's Prolog that will be compiled for use with the firm's runtime version on the 370 mainframes. The agreement marks the first commercial use of the artificial intelligence language in the IBM mainframe environment, spokesmen said.

Applix, Inc. and Digital Equipment Corp. have signed a cooperative marketing agreement for Applix's Alis office automation software running on Digital Equipment Corp.'s Ultrix-based workstations. Alis, a communications-based and graphics-based OA package, is available for Ultrix-based workstations for \$2,495. It is already out for DEC VAXs running Ultrix.

# On-Line rebids E-mail in CICS

From page 19

Among the major differences between On-Line Software's original and current E-mail systems are facilities in Bulletin that allow users to create personalized calendars and to schedule meetings electronically. The meeting scheduler will automatically check the calendar of the user and all other potential attendees to see whether a conflict exists.

If none do, it can schedule the meeting and ask other attendees to confirm their ability to attend. It can also reserve specified meeting resources, such as conference rooms or projectors, spokesmen said.

Two sign-on methods are provided — general user, under which an individual can sign on to any terminal and receive a message, and terminal, with which users can designate specific destinations. A confidentiality feature allows only the sender and recipient to view a message.

recipient to view a message.

In addition, when users sign on, the system informs them of pending messages, events that need to be confirmed and the next event scheduled on the calander.

Bulletin, unlike its predecessor, is being offered with optional interfaces to IBM's Distributed Office Support System, available in the first quarter of 1987, and Professional Office System, due in November. A Bulletin-to-Bulletin interface, making use of IBM Systems Network Architecture LU6.2 functions for communication between remote CICS sites,

will be available in the first quarter of 1987. Without the interface, Bulletin allows the exchange of electronic mail within one CICS environment, On-Line Software officials said.

Bulletin also accepts batch reports as input from other programs for transmission to electronic mailboxes. Bulletin's introductory licensing

Bulletin's introductory licensing fee is \$19,000 (OS) and \$14,000 (DOS) through Jan. 16. Thereafter, the licensing fees are \$25,000 and \$18,000, respectively.

The 150 companies already using On-Line Software's existing E-mail product will receive Bulletin at no extra charge as part of their maintenance fee, Crocker said.

"Bulletin holds up under high-volume usage," On-Line Software Vice-President Susan Luechinger said. "It can handle messages going to 2,000 to 3,000 destinations at once."

Disk storage, with an average industry growth rate of 40 percent a year\*, is the fastest growing component of most IBM mainframe installations. And, personnel costs to manage disk storage are rising rapidly as well. The ASM2 Autonated Storage Management software curbs expensive DASD growth and allows you to gain control of this valuable asset.

The benefits of ASM2 software are readily apparent. A 25 percent increase in available DASD space is commonplace for a new ASM2 user. More importantly, ASM2 software enables users to add DASD without adding speeds to reasonate it.

ASM2 software improves your overall data center performance in archiving, restoring, backing up and migrating data ... automatically. It offers a comprehensive set of DASD management tools that let you enforce individual storage management standards, and determine your own customized report formats. All with simple user interfaces.

ASM2 software further improves data center efficiency through its data restoration facility, IXR (finelligent Transparent Restore). With IXR, you'll never again have to pre-check data set availability, or issue manual restore requests. What's more, its unique look-ahead ability allows for more data to be archived and retrieved than ever before.

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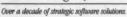
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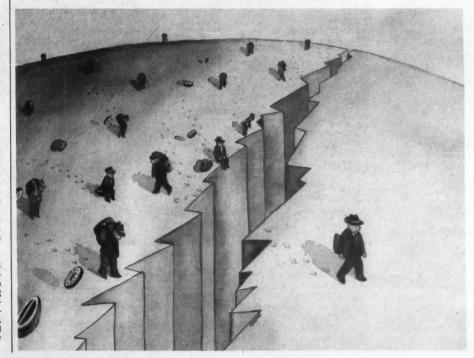
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# COMMUNICATIONS



DATA STREAM Elisabeth Horwitt

# Protocols don't stand alone

omething unprecedented occurred at a recent press preview of AT&T's Network of the Future exhibit [CW, Oct. 6]. Dick Snowden, director of service concepts for the AT&T business marketing group, was discuss ing an intriguing research project in progress at Bell Laboratories — a packetizing technique enabling the same switching facilities to handle voice, data and image transmissions in the same high-speed, economical fashion.

Snowden said the technology "offers enough clear benefits" to become part of a commercial service eventually, but that AT&T will not begin the implementation process until it and the other major carriers have agreed on standard protocols for key functions like error correction. "We can't develop those protocols independently," Snowden said.

This remark shows how drastically the market has changed since predives titure days, when Ma Bell set telecommunications standards and other carriers and equipment vendors had no choice but to follow. Now, AT&T is just one more vendor — albeit a formidable one - lobbying for industrywide adoption of the technologies and protocols it wants to use.

And sometimes AT&T has failed to win converts. For instance, the former Ma Bell has unsuccessfully tried to per suade its former progeny, the divested Bell operating companies, to introduce secondary channel support to their Dataphone Digital Services (DDS).

See PROTOCOLS paste 29

Horwitt is Computerworld's senior editor, communications.

# SNA to non-SNA link unveiled

# IBM protocol converter is no longer necessary

RALEIGH, N.C. A gateway recently introduced by Netlink, Inc. provides access to IBM's Systems Network Architecture (SNA) for a group of non-SNA devices em-

ulating a wide range of terminal protocols.
"SNA-Gate enables users to have a pure SNA network that includes non-SNA devices," Netlink Vice-President of Market-ing David McCormick said. "Before, you needed a protocol conversion either in a box or in the front end. SNA-Gate takes the place of an IBM protocol converter.

Shared Medical Systems Corp., a Mal-vern, Pa., hospital information system service company, has been beta-testing SNA-Gate for over a year as a way to connect an extensive installation of Digital Equipment Corp. VAXs, Four-Phase Systems,

Inc. computers and IBM Personal Computers into its IBM SNA VTAM network.

"We currently are a big Telecommunications Access Method (TCAM) shop and are using bisynchronous connections, but good old IBM has told us that they will pull the rug out from under TCAM within the next couple of years and that we have to convert entirely to SNA and VTAM," a company spokesman said. "We had already begun internally developing a bisync-to-SNA conversion product when we heard that Netlinks would soon be on the market." If the system continues to perform well, Shared Medical Systems will begin installing it soon, he added.

The service company had found no other satisfactory bisynchronous-to-SNA product on the market, the spokesman added. "It isn't an easy thing to do. The Netlink people have expertise in all the

'All of the top people at Netlink have See SNA page 29

# INSTANT ANALYSIS

**NEW THIS** 

■ LAN Systems.

Inc. offers Re-

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Executive multi-

other new products, see pp. 95-114.

LAN APX Core

tasking soft-

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"We've had an interesting minuet (in the post-divestiture regulatory arena] where the Federal Communications Commission is disco dancing, Judge Greene is waltzing and both are trying not to step on each other's toes."

- Andrew Lipman, Pepper, Hamilton & Scheetz, at the EIC/Intelligence **Fourth Annual** ommunications

# Tool links PC LANs to minis

ROSWELL, Ga. — Claiming to offer the first connection between an IBM Personal Computer local-area network (LAN) and an IBM System/36 or 38 minicomputer, Asher Technologies, Inc. recently intro-duced the Asher Minilink Gateway.

"The Minilink Gateway will dramatically reduce the number of discrete PC-tomini devices required, including our own Minilink product," Asher Technologies President Wil Riner said. "Clearly, there is still need for many single-user applica-tions, but networking is fast becoming the norm, especially for companies with mini-

The product consists of a plug-in card and software that converts a networked IBM PC, Personal Computer XT or PC AT into a gateway server that can handle up to seven sessions between an IBM depart-

# VMX 5000 voice messaging system makes its debut

By Eddy Goldberg NEW YORK -- Reduced pricing, increased storage, remote diagnostics and in-tegration with IBM's and Digital Equipment Corp.'s electronic mail systems are among the features offered by a voice n saging system recently unveiled by VMX,

Announced at the Info '86 conference, the VMX 5000 series voice messaging sys tem provides users with additional functionality in several areas, the company

The VMX-5000's Data Integration Module, set for release in the first quarter of 1987, allows the Voice Message Exchange system to integrate with computer-based electronic mail systems. Users of IBM's Professional Office System and DEC's All-

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#### COMMUNICATIONS

# Voice messaging system out

From page 27

In-1 office system can be notified at their terminals that voice messages are waiting. The Data Integration Module also allows users to send voice messages through their computer terminals via text-to-voice synthesis

Turbo immediately Voicenet. available, uses voice compression to end messages across phone lines 30% faster than they are spoken, reducing phone bills by nearly a third.

The VMX Manager introduces three system management capabilities that can be accessed through personal computers.

The Advanced Analysis Module allows access to and manipulation of VMX system reports.

The Mailbox Update Module allows system operators to perform data base changes from several PCs and batch them for sending to the VMX system. And a Directory Module provides on-line alphabetical listing of all system users and their address

#### Backup storage

A Redundant Voice Storage feature automatically provides up to 258 hours of backup storage for voice messages. The VMX manager and Re dundant Voice Storage will be available in the first quarter of 1987.

The VMX 5000 is built for easy

serviceability and maintenance, according to company President and Chief Executive Officer W. Dal Berry. Line cards display diagnostic in-formation and can be fine-tuned without special tools, and a new operator panel allows early problem de-tection. All critical components are field upgradable. The system also offers remote diagnostics.
The VMX-5000 also offers greater

performance at a reduced price, compared with its predecessor, the VMX-3. Voice message storage has been in-creased on a 64-port base system from 82 hours to 87 hours, while the price has been cut by 25% from \$525,000 for the VMX-3 to \$390,000 for the VMX 5000. A 64-port system with 258 hours of storage is available immediately for \$499.960. A boost to 516 hours of storage is scheduled for

#### Reduced footprint

An Intelligent Port Controller can handle more than 3,000 calls per hour, the company said. The VMX 5000's footprint has been reduced to width of 33 inches.

The VMX-5000 introduction positions the Dallas-based company for a turnaround, according to Donald H. Van Doren, president of Vanguard Telecommunications, Inc. in Morris-

"It gives them a chance to offer the same price/performance as the other companies that came along lat-Van Doren claimed. VMX lost approximately \$3.5 million to \$4 million in its fiscal year, which ended last June, he added.

# Tool links PC LANs to minis

mental processor and PCs on the LAN. The server can operate as a terminal or PC while performing gateway functions in background mode, according to Pete Wilcox, director of engineering at Asher Technologies. The product works with any LAN that runs the IBM PC Network software interface, Netbios

"I haven't seen it from anybody e," said Bob Zumwalt, director of operations for Kuppenheimer Manufacturing Co. in Norcross, Ga. Zum-walt plans to install the product shortly to connect PC LANs to his company's IBM System/38.

"We have a lot of users that need to go both ways, to and from the System/38" Zumwalt said, adding that he plans to have about 100 users communicating with the System/38.

#### Word processing, E-mail

Through the gateway, networked PC users can run word processing and exchange electronic mail on the System/38, using IBM's Office/38 package. The alternative was to buy a lot of individual emulation cards, one for each PC, at between \$600 and

\$900 each, Zumwalt explained.
The gateway also supports windowing and concurrent file transfer, allowing users to upload or download one file while working on another in window. There is also a hot-key function that permits the user to use one key to toggle back and forth be tween emulation and stand-alone PC processing.

Asher's gateway offers "big cost savings to users by allowing them to more efficiently leverage existing hardware and human resources," said Merv Adrian, chairman of the micro-to-mainframe special interest group of the NYPC users group.

#### Upgrade planned

An upgrade that Asher plans to introduce in November will enable the gateway to support IBM's PC Support/36 and PC Support/38. These products allow PC users to create virtual floppy disks on a System/36 or 38 and to use a System/36 or 38 printer as a PC printer, according to the vendor.

Wilcox added, however, that the PC Support packages are "rather slow," and that users such as Kuppenheimer's Zumwalt will get faster performance and more sophisticated functions on the Office/38 package that is already supported by the gate-

Emulation modes currently sup-ported by Minilink Gateway include IBM 5251, 5291 and 5295-1 displays and IBM 5219, 5224, 5225 and 5256 printers.

The price of the Asher Minilink Gateway is \$2,290 for both board and software. Users can upgrade from the single-user version to the Minilink Gateway for \$1,295 with no loss on the \$895 purchase price of the single-user version, according to Asher. The product is being shipped now.

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#### COMMUNICATIONS

# SNA-non-SNA link unveiled

From page 27

between 10 and 12 years of SNA expertise with IBM," agreed Claire Fleig, director of systems research at Los Altos, Calif., consulting firm In-ternational Technology Group. "Jumping into the SNA market is not like jumping into the micro market," she added.

SNA-Gate is likely to appeal to Fortune 500 services companies, many of which want to link Digital Equipment Corp. and Wang Laboratories, Inc. office automation systems to their IBM hosts, and to research oriented firms that want their VAXs and engineering workstations to share data with IBM hosts, according

SNA-Gate provides SNA conversion for between 60 and 80 terminal, personal computer, printer and minicomputer systems emulating various terminal protocols. Protocols sup-ported include ASCII, bisynchronous 3780 and 3271.

#### Supports multiple protocols

In addition, the product supports 3275 protocols, which the Wang Office automation system uses to con-nect with an IBM host over a dial-up switched network, according to Mc-Cormick. "We also convert Burroughs Corp. Poll Select protocols to SNA." he added.

The gateway concentrates incom-

ing user lines into a single trunk, saving companies on-line facilities, Mc-Cormick said. SNA-Gate reportedly supports either RS-232 connections for speeds of up to 19.2K bit/sec. or V.35 port connections for 56K bit/ sec. transmission speeds. Devices can be attached in two ways; either di-rectly or via leased or dial-up modem connections.

Each type of user session is mapped to an IBM logical unit by the device. The number of active ports supported concurrently varies with transmission speeds. For example, SNA-Gate can handle up to 16 terminals transmitting at 300 bit/sec. but only one minicomputer transmitting at 9.6K bit/sec., according to McCor-

#### One gate per host

Each SNA-Gate feeds into one SNA host. Ports can be individually reconfigured by loading software from a central point: the host's VTAM appli-

SNA-Gate Model 3703-1, which supports asynchronous and bisynchronous devices, is priced from \$7,500 for 2 ports to \$13,800 for 16 ports. Model 3703-1A, which supports only asynchronous devices, is priced from \$4,500 for 10 ports to \$7,200 for 16 ports. Both models are said to be available now.

"I expect to see Netlink filling other gaps in the SNA puzzle soon," Fleig said. "The SNA-Gate is a good beginning." beginning.

Netlink is "moving toward a prod-uct that will support LU6.2," McCor-

# Protocols don't stand alone

From page 27

AT&T has been ready since before divestiture to provide this channel, which would enable DDS for the first time to carry diagnostic and other network management-related infor-mation. But the regional companies, freed by divestiture from AT&T's control, only recently began filing tariffs for secondary channel sup-port on that last crucial link to customer premises [CW, October 6].

The telecommunications industry also failed to follow AT&T's lead in defining the D channel that supports signaling on the Integrated Services Digital Network (ISDN) basic inter-

Before the ISDN basic rate wa finalized, AT&T went ahead and developed Digital Communications Protocol (DCP), a workstation-to-private branch exchange interface tha AT&T called the forerunner to the ISDN basic rate.

#### AT&T 'gambied, lost'

Unfortunately for AT&T, it guessed wrong, allocated 8K bit/sec. bandwidth for out-of-band signaling on DCP and then found out that the ISDN basic rate allocates 16K bit/ sec. bandwidth. "We gambled and lost on that one," an AT&T spokesman says ruefully.

If Snowden's comments are any indication, AT&T has learned something from the above debacles and is more willing to cooperate with other carriers and equipment vendors even wait for them to catch up to its own technology level, when neces sary - in order to facilitate the implementation of the industry standards that will ensure that its own services get delivered smoothly to the user.

"We've had 10 years to develop out-of-band signaling, which means we're well ahead of competitors in our ability to provide on-demand service applications," Snowden points out. "But we still have to wait for the evolution of ISDN primary rate signaling that will link our central offices to those of, say, Illinois Bell.

'Divesture has made interoperability a lot tougher, because we can't simply extend our out-of-band signaling to the divested Bell operating companies. And we don't want to implement the signaling channel on our own premises once now and then again when the standards are finalized," Snowden adds.

If only computer and local-area network vendors had adopted that bit of wisdom a few years ago. Imagine how much easier life would be if the International Standards Organization's Open Systems Intercon-nect standard had been developed in time to become an intrinsic part of Digital Equipment Corp.'s Decnet and All-In-1, IBM's Token-Ring, Wang Laboratories, Inc.'s Wang Office and all of those other systems that MIS and communications managers are now vainly trying to link to-

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# **SYSTEMS & PERIPHERALS**



# IBM makes it. interesting

t least IBM piqued people's interest, even if the answers were lacking once the company caught that interest and people began to ask a few questions. The IBM 9370, introduced two weeks ago, fell short of some customer expectations, but it did prove that the customer and IBM are again thinking in terms of distributed

and departmental processing.
On the positive side, IBM acknowledged that there is some truth to the claims of early personal computer advocates and minicomputer vendors. Those groups have said for years that distributed processing will bring the glass-room world of the mainframe to a crashing end.

The fact that IBM, which was so slow to get into the personal computer market that it now owns, is moving its 370 architecture into office environ-- which does not translate to office automation - shows that the computer giant recognizes the need to move processing closer to the user, even if the multimillion dollar mainframe remains a key element in corporate computing.

In the 9370's case, the user is likely to be the same person who has been running or writing mainframe applications such as accounting or payroll packages on a controlled-environment mainframe. But now users can do that work with the processor a few feet from their desk. The 9370 does not shape up as a machine to plug in and forget about. Support for IBM's VM, See IBM page 32

Connolly is Computerworld's senior editor, systems & peripherals.

# **DEC boosts superminis**' memory, expandability

By Rosemary Hamilton MAYNARD, Mass. — Digital Equipment Corp. increased the maximum main memory and peripheral support of its VAX 8200 and 8300 superminicomputers, which were introduced earlier this year.

The enhancements are being sold under new packaging for the systems, called Configuration 2. The new systems reportedly double the expansion capabilities of cur-rent 8200 and 8300 models while requiring only 30% more floor space.

Configuration 2 systems will be be offered as prepackaged models or as components and can support up to 32M bytes of main memory, a 33% increase over the 24M- byte maximum main memory configuration that exists on current 8200s and 8300s, now referred to as Configuration 1

The systems have a 24-slot VAXBI bus backplane, compared with a 12-slot VAXBI backplane on Configuration 1 models. The new backplane can support the additional memory, up to 16 disk drives, four controllers, three tape drives, 48 asynchronous communications lines and six synchronous communications lines.

The systems also have an Ethernet networking interface. A Unibus adapter is available as an option. Users can also purchase the system on a component basis. An entry-level model costs \$89,000.

The Configuration 2 8300 has a starting price of \$119,000; a prepackaged version costs \$169,000. The prepackaged 8300 comes with 12M bytes of main memory, a 456M-byte disk drive, a KDB50 disk controller, a TU81-plus tape drive, a DMB32 communications controller and licenses for the VMS operating system and Decnet networking software.

The packages are designed to complenent the prior models, and they can be incorporated into a Vaxcluster system, the vendor said.

#### INSIDE

McDonnell Douglas adds to its Pick-based line of small business systems/32

#### **NEW THIS** WEEK

- Calcomp adds five electrostatic plotting systems to its 5700 plotter
- For more on this and other new products, see pp. 95-114.

#### INSTANT ANALYSIS

"The problem with announcing products with a long lead time is that people tend to wait for them.

- George C. McQuilken, Software Productivity Research, Inc. president, on the impact of a e-year lead time for IBM's 9370

# NCR offers latest 32-bit Tower

# Provides 16-user support. greater processing power

By Eddy Goldberg NEW YORK -

NCR Corp. has introduced the Tower 32/400, a 32-bit supermibased on a 16.7-MHz Motorola, 68020 CPU with support for up to 16 users. NCR also renamed the Tower 32, a 48user 68020-based machine, the Tower 32/

The 32/400, introduced during the Info '86 show in New York, offers the process-ing power of a 68020 CPU to a smaller number of users than would justify the purchase of the larger 32/600, said John Gray, program manager for Unix systems

As the latest addition to the Tower family, the 32/400 offers more than double the performance of the 16-bit, MC68010-based Tower XP and more than triple that of the Minitower, according to Larry Miller, director of product marketing at NCR. Programs for the XP, MiniTower, 32/400 and 32/600 are object code-compatible across the line, he said.

There is definitely a need for this class of product," said Ralph Mahoney, 5000 series program director for Sperry Corp. in Blue Bell, Pa. Sperry is an OEM customer for Tower systems designed to its own specifications.

Mahoney said the 16-user system will fill a need in the departmental computing area, employed in smaller corporate or governmental departments and work-groups as part of a network. "It's the right level of price/performance for depart-ments in major corporations," Mahoney added. He said that he sees a market in the small-business environment for accounting-type solutions as well as vertical mar-

# Texas firm halves mainframe data backup with tape cache

# Expensive cartridge conversion delayed

By Donna Raimondi
THE WOODLANDS, Texas oil and land development firm faced with increasingly undesirable daily data backup times has opted to install a tape cache device to cut backup times for its mainframe operation. The cache device, which can compact data to less than half its original space on the tape, has delayed an expensive leap into tape cartridge tech-

We were not going to convert to tape cartridges, we were going to add them to our existing tape facilities. And because we were out of computer room space, that meant adding a

new \$200,000 raised-floor room," explains B. G. Blackburn, director of computer production at Mitchell Energy and Development Corp., in The Woodlands. By installing a Memorex Corp. 6522 tape cache device, Mitchell has put off having to bring in cartridges for about two years, Blackburn says.
Mitchell's IBM 3081 Model K main-

frame, running under IBM's MVS/SP, takes care of the computing needs of the entire business, according to Blackburn. The company drills oil and gas wells. It also constructs and manages pipelines and develops residential real estate, like the 12-yearold city it occupies.

Because of the current depressed economic conditions of the oil and gas business, saving both time and money is very important to Mitchell.

"A total conversion to tape cartridge technology is down the road," Black-burn says. "It's not a horrendous job, it's just something that — if you can defer that type of expenditure for a time - it helps out in the present

A data base system that requires "quite a bit" of direct-access storage device (DASD) space, according to Blackburn, helped bring the problem to a head. "It was costing us more than three hours a day to back up the DASD. With the tape cache device, we now have runtimes of less than two hours daily," Blackburn adds.

Mitchell brought in a beta-test version of Memorex's one-channel 6250 in 1985 and then upgraded to the two-channel 6522 model in March 1986. The tape cache device receives data from the CPU prior to entering the tape controller. Based on job control language (JCL) instructions, it will either pass the data straight on to the tape or compact it and reduce the amount of storage space required on the tane.

We do not compact the data for our operating system backup or the related libraries, or on any files that we might send out to banks or other companies that we might send data Blackburn explains. That is because compacted data must be uncompacted using the same type of cache device. "We compact it for our daily and weekly backups and our own production files."

Prior to bringing in the device, backup required 126 tapes night. With the compaction. Mitchell has brought that down to 66 vol-

## SYSTEMS & PERIPHERALS

# interesting

From page 31

VSE and MVS/SP seems to mean that an operator, systems programmer or other technical type should be close by. However, the system is a step in the right direction.

The questions that IBM leaves unanswered include some basic customer inquiries about what they will pay for a specific system with a specific performance level. Customers wonder why they have to wait a year before they see 9370s available in volume.

Another question deals with the impact the 9370 will have on the System/36 minicomputer that IBM has pushed on customers as an office automation and entrylevel DP system.

#### **OA** capability limited

IBM customers who expected the 9370 to address their office automation woes were probably disappointed with what they saw. The apparent need for a trained attendant and the lack of direct personal computer connections under anything except Unix may limit the current 9370's office automation capability.

But even in terms of office automation, the 9370 seems to have potential. Analyst Bob Djurdjevic, president of Annex Research, Inc., maintains that the 9370s can be potent competitors for Digital Equipment Corp.'s VAX family in terms of compatibility and that the machines can kill the System/36 in terms of raw power.

Meanwhile, users of earlier IBM distributed process ing systems may be looking favorably on the 9370. DPX, U.S.A., a research and consulting firm, last week said that the 9370, which some observers viewed as a re placement for the IBM 4361, is also the apparent successor to the 8100 family. The consulting firm speculated that IBM will follow one of two courses.

One would be to use a DPPX/370 solution to sell 9370s to 8100 users, while the other would be to promote DPPX/370 as a global distributed data processing solution.

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# IBM makes it | McDonnell Douglas augments Pick-based line

By James Connolly IRVINE, Calif. -

- Adding a peripheral controller that increases the number of users supported, McDonnell Douglas Computer Systems Co. has introduced two high-end models in its M6000 line of small business systems. The M6640 and M6650 re-

portedly support from 16 to 64 users, rather than the earlier maximum of 48 users supported by the M6527, because of the addition of the company's Peripheral LAN Controller.

This new controller provides a more intelligent and higher performance level of terminal port control. With only a single board required for all 64 ports, the number of available ports is in-

creased while significantly reducing the cost per port," said John Howarth, vicepresident of marketing for McDonnell Douglas.

The systems bring to five the number of models in the M6000 family, which sup-ports McDonnell Douglas's Reality version of Pick Systems, Inc.'s Pick operating

The key difference be-tween the M6640 and the M6650, both of which offer from 1M to 2M bytes of memory, is that the M6650 can support a higher disk capacity. The 6640, which can be upgraded to the 6650, is available with 75M bytes of disk storage. The 6650 is available with up to 485M bytes of disk storage.

# The printers of Texas The printers you need when



#### SYSTEMS & PERIPHERALS

# NCR offers 32-bit Tower

From page 31

ket applications.

Disk and tape I/O performance on the 32/400 has been improved through the use of a 16-bit Intel Corp. Multibus. Faster I/O between the CPU and memory has been achieved through a 32-bit proprietary bus.

The 32/400, priced from \$14,995 to \$54,810 depending on configuration, will begin shipping in quantity in November. Sales will be primarily to OEMs and value-added resellers.

added resellers.

The \$14,905 base configuration includes 1M byte of main memory, 46M bytes of internal storage, a 48M-byte tape cartridge backup and NCR's Unix System V.2 business module operating system, which incorporates record and file locking.

# Firm halves data backup

From page 31

umes. Each tape costs about \$15. "That is more than just a little bonus," Blackburn

says.
"We bought ourselves an hour and a half of computer time each day without making a large capital expenditure," Blackburn adds. "We

added a dozen data volumes in the last year and still came out ahead in the backup game."

According to Blackburn, channel speed has effectively been increased from 1.5M to 3M byte/sec. "The channel speed itself actually remains the same. But once we achieved a certain level of compaction, then the effective throughput from the CPU to the tape becomes 3M byte/sec. or reaches close to that level," he says.

# Bell Labs nets Darpa contract

By James Connolly

WHIPPANY, N.J. — AT&T Bell Laboratories plans to launch a parallel processing venture with the awarding of a contract from the Defense Advanced Research Projects Advanced (Norma)

Advanced nesearch Projects
Agency (Darpa).

AT&T officials said the
\$7.7 million, three-year contract calls for AT&T and subcontractor Fifth Generation
Computer Corp. to develop
prototypes of a computer
that can recognize speech
and images and do other complex pattern-matching tasks.

Robert Lewine, head of the Bell Laboratories Special Systems Design Department, said the goal of the project is to recognize large-vocabulary human speech as fast as

it is spoken.

Fifth Generation Computer chief scientist Salvatore Stolfo said AT&T will extend his company's Dado binary tree parallel processing architecture to speech and image recognition.

AT&T representatives reported that the company expects to have the first prototype ready by next spring.

The Darpa contract was awarded under the Pentagon's Strategic Computing Initiative.

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Our 880s are the perfect upward migration and high-speed complement to the Model 810. They're twice as fast, fully compatible with the 810, offer

correspondence-quality printing, raster graphics, and come in three models—the standard 880, the 880DP and the 880AT. The DP model offers the higher throughput necessary for high-speed data processing forms and report printing applications. And the AT model is ideal for multi-user environments because it is both hardware- and software-compatible with AT- and XT-class personal computers.

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Dual-mode, letter-quality, color printing and graphics, too. However you use your PC, there's a Tl micro-printer to match. Our micro-printers feature front plug-in fonts, easy-to-use control panels and a long service life. They're

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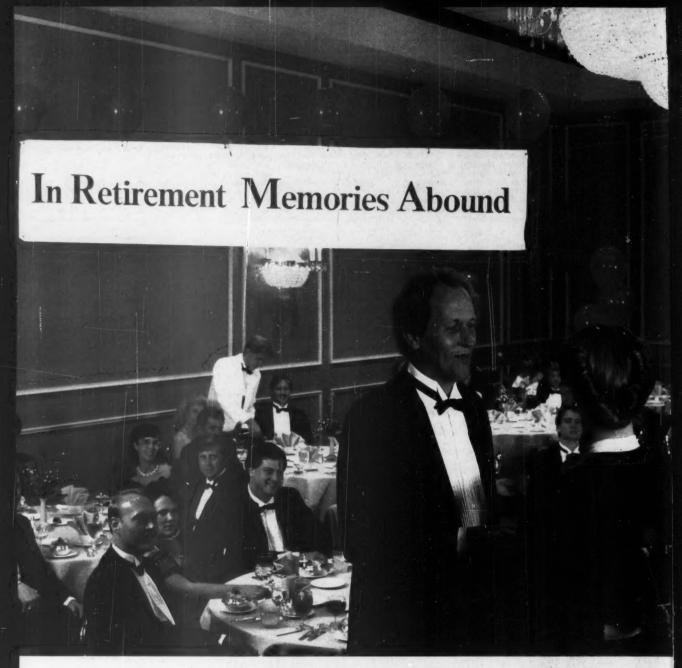
To be TI printers, the Omnil.aser had to print unerringly at incredible speed with unrivaled quality. And they had to be simple to use. The Omnil.aser Model 2015 will last in shared-resource work environments where lesser printers fail. They had to be the "810" of laser

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# **Retire Your PC Coax Connection**

The PC-to-host coax connection. She was a good piece of equipment working with coax cable and cluster controllers, but time just passed her by. End users started needing more than simple host access. They also needed their PCs to share resources around the office. That's when local area networks came along to fill the need.

LANs are dramatically increasing office productivity through efficient information management. And Gateways are exploiting LAN versatility by providing cost-effective host communication for PCs and other network devices. Now for thousands of dollars less, LANs and Gateways provide PC-to-PC and PC-to-host communications all without a cluster controller.

INS Gateway PC Adapters are engineered around proven INS SNA 3274 cluster controller emulation. A single INS Gateway PC Adapter in an IBM NETBIOS compatible LAN, including Token Ring, will support up to 32 logical unit sessions. The LAN allows each PC on the network to share disks, printers and other resources while the Gateway allows performance of any host-supported function and maintains host access.

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#### **MICROCOMPUTERS**



#### Don't be left in the DOS dust

recent conversation I had with the president of a medium-size company reminded me we may take for granted that others know what we already know. A strictly nontechnical person I know had been using an IBM Personal Computer for several years and was having trouble getting some new software started. He thought the disk he'd been given might be defec-

Putting the disk into the floppy disk drive, I found that it was in perfectly good order. The first-level directory contained COMMAND: COM and two subdirectory entries, one of which contained the software my friend wanted

In explaining things to my friend, I discovered, to my surprise, that nearly everything I was saying was completely unfamiliar to him. He had, for the past two years, been loading Lotus Development Corp. 1-2-3 by putting the system disk in the A drive and turning the power on.

Beyond knowing that CTRL-ALT-DEL has the same effect, even the most elementary aspects of the Microsoft Corp. MS-DOS operating system were unknown to him.

He had been trying to load his software by putting the disk in the A drive and turning the power on, as he did

Mind you, I am talking about an intelligent, successful individual who has over two years' experience using personal computers. It's just that

See DON'T page 36

Zachmann is vice-president of research at International Data Corp.

#### **Borland Prolog upgrade out**

#### Provides more efficient. faster data management

By Peggy Watt

SCOTTS VALLEY, Calif. - Borland International, Inc. has released a new version of Turbo Prolog, its foray into artificial intelligence development tools, which includes faster compilation time and filecustomization features

The new release, Version 1.1, also includes instructions for modifying and linking Assembler and C programs with Pro-log, according to Borland. An on-disk tutorial was expanded to include more than 100 examples of Prolog development, including an expert system, natural lan-guage interface and differential equations.

The samples are where we can really show and tell what Prolog can do," said Mike Floyd, Prolog technical support rep-resentative. Programmers can go through the code to reconstruct the samples or modify them, "or if you're not a program-mer, a lot of the sample programs can be

Also new is a generic pop-up menu program, which programmers can include in their source code for applications rather than writing their own pop-up menus, Floyd said.

The new version was designed to be faster and more efficient, according to Borland. It has an internal linker for single-step compiling, requires less memory space and has more efficient management of random-access memory-based data, Floyd noted. He said the new Borland Linker, with the help of the expanded compiler menu, will compile an executable file up to three times faster than the original version.

Many of the changes are answers to early users' comments, Floyd added. "We've been taking feedback and wanted to be responsive, especially with an early release like that," he claimed.

Upgrades to Turbo Prolog Version 1.1, available only for the IBM PC and compatible systems, will be provided free to all users who bought the original \$99.95 release since its introduction in March.

#### **NEW THIS**

- NEC introduces the PC-8500 portable
- For more on this and other new products, see pp. 95-114.

#### INSTANT ANALYSIS

"It looks like we're headed for a shakeout, and the industry's just starting. We may have some drop out without even shipping."

— Paul Gravao

chairman and CEO of Micrografx, Inc. on desktop publishing.

#### Polytron's software acceleration tool debuts for IBM PCs

\$995

By David Bright
BEAVERTON, Ore. — Polytron Corp. early this month introduced a software acceleration program said to at least double the speed of IBM Personal Computer soft-

Positioned as an alternative or complement to accelerator cards, the \$79.95 package requires no software modification or extra hardware, according to marketing director Doug Root.

Users considering accelerator cards should try Polyboost-The Software Accelerator first, Root said, because it can increase a program's speed by two to 10

See ACCELERATION page 37

#### Microsoft plans language links

By Peggy Watt REDMOND, Wash. - Better connectivity among programming languages, some of it through a graphical interface such as Microsoft Windows, and new tools to take advantage of up-and-coming high-speed processors and serve a growing DP market are in the offing from Microsoft Corp.'s languages group.

Microsoft spokesmen related plans for language extensions to share calling procedures and be more portable among each other and among vendors at a recent daylong languages seminar for the press.

While systems and languages now produce 50% of Microsoft's revenue, demand for applications generators is expected to spurt, said Rob Dickerson, product See MICROSOFT page 37

#### Oracle's SQL\*Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL \*Calc, is the first to combine a mainframe-class relational DBMS with an Spreadsheet

easy-to-learn and famil-iar PC spreadsheet user SQL\*Calc is designed

for 1-2-3 users who've run out of memory, flexibility and patience. SQL\*Calc allows you to put SQL database commands into spreadsheet cells...just like formulas. This permits you to access large amounts of data directly from your

spreadsheet.
Like all Oracle Corporation products, SQL\*Calc runs identically on main-frames, minicomputers and PCs. SQL\*Calc's foundation is the

ORACLE relational DBMS, which pro

vides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large compu-ters. The SQL commands available in ORACLE are Relational DEMS

identical to the SQL commands in IBM's premier main-frame relational DBMS pro-ducts, SQL/DS and DB2.

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells

in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL\*Calc also permits users to modify the database-and even create new data-base tables-directly from the spreadsheet.

SQL\*Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL\*Calc's ORACLE DBMS requires no 1-2-3. And SQL\*Calcs ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, of any other PC DBMS.
SQL\*Calc is available immediately for IBM PC/
XTs and ATs for \$995.\* SQL\*Calc will soon be

available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL\*Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA

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#### MICROCOMPUTERS

#### Don't be left in the DOS dust

all of that has been within a single automatically loaded program. This incident drove home the point that there are an awful lot of people who still have a lot to learn about using personal computers.

Coincidentally, it was the evening after this episode that I first broke the shrink wrap on Microsoft's Learning DOS. This package, which costs \$29.95, is precisely what is needed to make things easier for people who could benefit greatly from learning about MS-DOS but are not

quite sure how to go about it.

Learning DOS comes with a slim,

useful manual and four floppy disks, one of which is actually advertising. The disks are titled "Lessons for Systems with a Hard Disk," "Lessons for Systems without a Hard Disk," and "DOS Quick Reference." The first two are on-line tutorials; you use one or the other, depending on whether the system you will normally use has a hard disk.

Using a very attractive menu in-terface, the "Lessons" disk provides an extremely useful and well-designed introductory course in using MS-DOS. Followed through from start to finish Learning DOS will give anyone a full understanding of and proficiency in the use of MS-DOS.

Starting with the most basic considerations, with well-conceived and well-executed explanations, Learning DOS goes on to cover files and directories using applications, backup and hardware setup commands, including AUTOEXEC.BAT and CONFIG.SYS files. Even a user more or less familiar with DOS is likely to learn something useful with the tutorial.

The whole thing is designed so that the beginner can start at the beginning and work right through. More experienced users are encouraged to work through selected lessons identified as covering "core concepts and skills." And hotshots are invited to try the summary
"Practicing What You've Learned" self test. "This will give you," as the documentation puts it, "a good idea of what you still need to learn." It

The lessons are well organized. Each normally includes one or more practice sessions that put the material learned to use, thus reinforcing learning. Lessons can be skipped if desired, however, by simply pressing ALT and the space bar.

The menu structure lets you go where you like in the tutorial. In addition, in a clever and innovative way, pressing the CTRL key calls up a menu bar across the bottom of the screen. This indicates letter keys that may be pressed while still hold-ing down the CRTL key. These are used to go back a screen, get a hint while practicing, go to the index, go to the menu, skip the practice, quit the course, skip to the lesson summary or skip to the troubleshooting ses

The manual, in addition to explaining how to use the program, contains a useful section titled "DOS Tips: Advanced Features" covering more advanced topics like filters, pipes and redirection, as well as amplifying a number of other topics

more briefly treated in the tutorial. Best of all, however, is the "DOS Quick Reference" facility that come on the fourth diskette. In fact, this is an enormously useful Help command that provides an on-line MS-DOS Help facility. This is not merely a handy reference for beginners but a useful tool for experienced users. If you can never remember all the parameters of infrequently used com-mands like MODE and PROMPT, you are likely to be as appreciative of the Help facility as I am.

Learning DOS is an excellent program that will be especially attrac-tive to information center personnel pressed with the need to train and support end users. It is certainly going to save me a lot of time that might otherwise have been spent explaining DOS to colleagues and

Gene Amdahl describes new enhancements to ELXSI's System 6400 parallel multiprocessing computer.

#### "... our new M6420 processor and 768 Mbyte memory give you a more powerful tool. Our new VMS compatibility makes the tool even more widely applicable."

"Although the ELXSI™ System 6400™ has already filled the gapbetween supermini and supercom-puter very well, we recently saw a chance to make important product enhancements

chance to make important product enhancements.

New, extended performance CPU "The most significant introduction is our M6420 Extended Performance CPU. Benchmarks show performance interprovements of up to 200 percent over our existing M6410 processor, which boosts the high-end performance of the System 6400 to well over 100 Whetstone MIPs. "With its plug-in parallel processing capability, this gives the System 6400 a price/performance advantage over almost any equivalent system, from VAX and IBM models (see barchart) up to and including the Cray 1-S supercomputer. "Because of the System 6400's architecture, this new processor won't obsolete any of our existing M6410 CPUs—they'll work side by side in the same system, with no modification necessary.

mance of systems from Cray, DEC and IBI ith a dual-M6420 ELXSI Dyad, a four-M64 and a fully configured 12-M6420 ELXSI m prk erformance Number (1) lative performance data reported d Roundup, plus ELXSI bench

Internal memory boosted up to 768 Megabytes "New memory arrays provide up to 768 Mbytes of internal memory, using 256 Kbyte RAM chips. That's the largest main memory avail-able today in anything short of a supercomputer!

ause today in anything short of a supercomputer! "What's more, we are now testing one-Megabit RAMs, and in early 1987 we'll offer arrays with up to two Gigabytes of system memory, which can be installed into existing System

6400s immediately. No reworking

"Up to now, users with memory-dependent applications, such as IC design or circuit simulation, could only work with a portion of their

more memory and more than six

times the processing power...and provide parallel processing as well. "The new products include ECL" which emulates the DCL" Digital Command Language Interpreter;



models in main memory at one time. Now they can load entire 15 or 20 Mbyte models, and larger. They can work with the whole thing in real time, eliminating complicated over-lays or program segmentation

This capability alone can speed or mis capaonity atome can speen up processing time on a par with a faster CPU. In fact, large memories allowed one ELXSI user to bring a new product to market three months ahead of schedule.

New compatibility with

DEC systems
"ELXSI has an ongoing commitment to compatibility with DEC"
VMS" environments. Our new EMS"

VMS<sup>®</sup> environments. Our new EMS<sup>®</sup> Environment software will give VAX<sup>®</sup> users a simple migration to a powerful parallel multiprocessor, our System 6400, which will handle all their applications in conjunction with their existing VAX equipment. "This EMS software emulates a VAX computer more closely than any other computer available today. It allows VAX users, with no additional training, to perform almost any job on an ELXSI system which can complement and extend the capabilities of the largest VAX with 24 times

ERT,™ which emulates the VMS System Services and Run-Time Library routines; and an EDT-compatible Editor.

"By the first quarter of 1987, ELXSI will support CommUnity," a DECnet" Phase IV End Node emulation, enabling our 6400s to communicate with VAXs running DECnet Phase III and later versions."

and later versions."

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ELXSI introduced the first commercial parallel processing computer in 1983, and today has major installations around the world.

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#### MICROCOMPUTERS

#### Microsoft plans language links

From page 35

marketing manager of Microsoft's

languages group.
"We believe Excel won on the Macintosh because it was programmable and Jazz was not," Dickerson said of the competing integrated business packages from Microsoft and Lotus Development Corp. "Very few of our applications are not programmable at some level."

But new development tools are in increasing demand and on the horizon, according to Microsoft.

"DP departments are becoming the most significant users. With the 80286 systems' debut and promises

of the 386, the PC is become a viable machine for prototyping for a main-frame." Dickerson noted. Increased DP control with the appearance of networks also promises "more microcomputer programming than ever be-fore," Dickerson said.

Some needs of those high-performance microprocessors are being explored with Windows, Microsoft's graphic operating environment, said Paul Davis, senior engineer and member of the Windows' marketing team. Some variable memory allocation capabilities are in Windows, he said. With the C language, for example, a Windows programmer can break memory into small chunks for different programming or application

The memory management chal-

lenge of the advanced 80286 and 80386 micros will require segmenting and some shared files, said Greg Whitten, Microsoft language development director.

Microsoft also tries to extend 80286 capabilities to the next chip generation, he said. "We've turned the 286 linker into a 286/386 linker," he said

#### 'Acts like a fast 8088'

'The 286 real time mode acts like a fast 8088, with 16 segments," Whit-ten continued. "To write to both, you must write to the subsets of 8088 and 80286 instructions and also to a seg-mented programming model." By writing a program to address smaller chunks of memory, it will still run in 8088/8086-based systems, but take advantage of advanced chips' capabilities when available.

Future releases of languages will also share characteristics, according to Microsoft. "The code generator in C will be used in the next Fortran, Whitten claimed. "We try to synchronize the language releas

A Windows Basic is coming, how-ever, along with "some tools that will make it easier to write to Windows in Pascal and Fortran," Dickerson said. Xenix tools show up faster, such as the 80386 Xenix tool kit recently announced at the unveiling of Compaq Computer Corp's 80386-based sys tem. However, an MS-DOS built to take advantage of 80386 capabilities will not be on the shelves soon.

'When we get to Protect mode, I think we'll have some very nice language tools to use to develop some very impressive applications," Whit-ten said. "We're waiting for a target environment based on DOS."

#### Acceleration tool debuts

From page 35

The package is a set of three memory-resident programs — disk ac-cess, screen display and keyboard inthat speed up three input/ output functions on the IBM PC, Personal Computer XT and AT. Because the disk access portion offers the most significant performance boost of the three functions, Polyboost will greatly speed disk-intensive applica-tions, particularly data base management systems, Root declared.

Even systems that already have accelerator cards with faster processors can be speeded up with Polyboost, Root said, because it speeds the flow of information to and from accelerator cards.

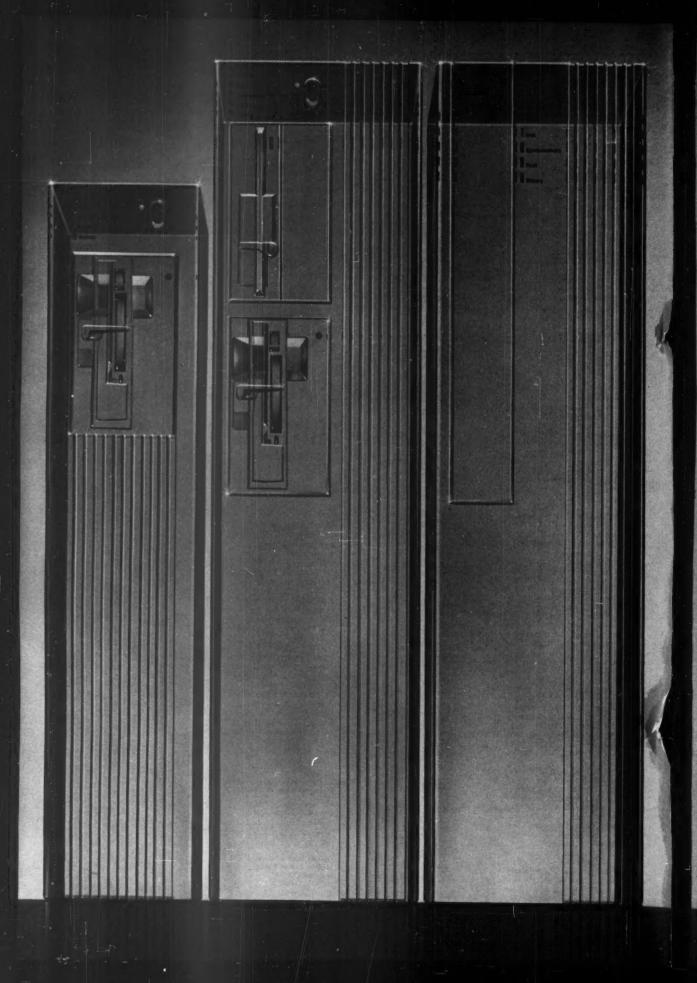
Each of Polyboost's three programs can operate independently and be loaded separately. With the disk program, users can define a 5K-byte to 500K-byte disk cache in randomaccess memory (RAM), which stores the most frequently-accessed infor-mation from the disk drives. For systems with expanded or extended memory, the disk cache can be as large as 2.2M bytes.

Polyboost's screen display portion routes data directly to the screen, by-passing some MS-DOS and BIOS routines. This display function is said to provide faster scrolling and text dis-play. The program also eliminates the flicker and flash often caused by IBM Color Graphics Adapter (CGA) cards, Root claimed. Polyboost works with monochrome, CGA and Hercules Computer Technology, Inc. graphics

Polyboost's keyboard-enhance ent program increases the size of the keyboard type-ahead buffer from 16 to 128 characters and lets users adjust the key-repeat rate for the cursor and character keys. The program also includes a command line editor for recalling, editing and executing MS-DOS commands

According to Root, Polyboost is completely compatible with other RAM-resident software, accelerator cards and chips, IBM PC applications software and disk utilities. Other software programs on the market offer disk caching or display improvement, but Root claimed Polyboost is the only program to also speed keyboard input.





#### OUR ADVANTAGE IN MIGRATION IS CLEAR

NCR's nit-picking fanatics took a clear-headed approach in designing the NCR Tower systems. By making Towers fully compatible, from the MiniTower (1-8) users) to the Tower XP (1-16 users) to the Tower 32 (1-32 users), they've provided clean, clear upward growth path for your

customers.

Compatibility across the Tower family lets you easily move your software from one Tower to the other with little alteration. So you can upgrade your customers' systems with a minimum of software maintenance and support.

And just as the Towers communicate fluently with each other, they talk to a host of standard protocols including Ethernet, 2780/3270, SNA and X.25. In fact, industry standards such as UNIX, Multibus, SCSI, RS-232 and others are built into every Tower to allow VARs the flexibility they need.

For your customers, it's the path to

For your customers, it's the path to greater productivity. For you, it's a road to bigger, more lucrative accounts.

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clearly in focus.

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#### **Hardware Roundup**

Edited by Barbara Wierzbicki

#### Microcomputers usiness users can now buy an IBM Personal Computer XT-

By DAVID BRIGHT

Compatibility, supplier viability and connectability — in that order — ranked highest in influencing purchase decisions at large corporations.

compatible system through mail or-der for as little as \$375, or they can pick one up at a department store for

In more traditional business channels, dealers are stocking up on Compaq Computer Corp.'s souped-up per sonal computer built around the Intel Corp. 32-bit 80386 microprocessor, while Apple Computer, Inc.'s 1Mbyte Macintosh Plus is attracting attention as a serious business tool

But despite continued competition from low-priced clones, the threat of more powerful machines or anything Apple might do, the microcomputer world still revolves around IBM.

Virtually no business microcomputers are built without IBM Person al Computer compatibility in mind, and that includes the mail-order cheapies as well as the new class of 32-bit machines.

Third-party hardware is available to add IBM PC compatibility to the Macintosh, and even Apple itself is making plans for future IBM PC com-

With the exception of Compaq, which usually keeps its prices on a par with IBM's, the major selling point for most clone manufacturers is lower prices. Despite the fierce price competition among the scores of clones, the price of microcomputers is not the primary concern at large corporations, one study con-

According to a study by the New-ton-Evans Research Co. of Ellicott City, Md., compatibility, supplier viability and connectability — in that order — ranked highest in influencing purchase decisions at large corporations. In the survey of 156 companies, price was a major factor in only 3% of the cases.

For these reasons, many large corporations remain firm in their decisions to stick with mainstream products from the likes of IBM and

The issue with non-IBM companies is "not only whether they are mes is 'not only wnetner they are going to stay around but also how well they will be able to maintain compatibility," agrees Ed Macke, manager of personal computer systems at Northrop Defense Systems Division in Chicago. Macke, who manages 400 IBM PC XTs and ATs, says be has no intention of switching and switching the statement of the systems. says he has no intention of switching from Big Blue. In 1985, IBM commanded a 34.3%

share of the \$13.3 billion U.S. personal computer market, according to International Data Corp. (IDC), a Framingham, Mass., market research firm. Apple was a distant second with a 10.7% share, followed by Compaq with 5.9%. By most estimates, many more than 5 million IBM PC-family systems have been in-stalled worldwide.

Since the last Hardware Roundup 14 months ago, the major developments from IBM have been price cuts to ward off the clones and the introduction of new XT and AT versions, as well as the PC Convertible — Big Blue's first entry in the laptop computer market.

n April, IBM reduced prices on some systems by as much as 25%. For example, the price of a 256K-byte XT with a 10M-byte hard disk drive was cut from \$3,895 to \$2,895.

In July, Big Blue reduced dealer prices on selected PC and AT models by as much as 18%, and a month later the company cut the direct sales price of its basic 5-year-old PC by as much as 22%.

However, since many of the price cuts were on slower moving system — such as two older PC models and the 6-MHz PC AT, IBM's slowest AT — many analysts suggested that IBM was essentially conducting a clear-ance sale to rid itself of its old inventory and to make way for newer

systems.
"It's very encouraging that the

price is coming down, but I don't want one," says Cheryl Currid, man-ager of sales, systems, planning and information at Coca-Cola Co. Foods Division in Houston.

With outdated features like a 4.77-MHz Intel 8088 microprocessor, five expansion slots and a 65W powrive expansion slots and a bbw pow-er supply, the PC is "not an accept-able business computer," Currid ex-plains. "The problem with the PC is that IBM has the slowest IBM compatible on the market.

For a while, IBM also had one of the slowest AT compatibles on the market. But in April, the computer giant added a faster AT using an 8-MHz Intel 80286 microprocessor, while continuing to sell the original 6-MHz version.

At that time, IBM also announced three new XT models with half-height floppy drives, an optional 20M-byte hard disk drive and room for a full 640K bytes of randomaccess memory (RAM) on the system board.

But still, a performance gap exist-ed between the PC XT and PC AT.

Last month, with the introduction of the XT Model 286, IBM moved to fill that gap. Observers say that the arrival of the Intel 80286-based PC XT Model 286 further indicates that the end is near for IBM's line of 8088based systems.

he XT Model 286 is basically a a slightly slower performance AT in an XT box at a lower price.
While the \$5,295 AT uses an 8-MHz CPU with one wait state and a 30Mbyte hard disk drive with a 40-mse access time, the \$3,995 XT Model 286 employs a 6-MHz CPU with no wait states and an 85-msec, 20M-byte

Following many months of rumors and speculation, IBM in April introduced its 12-lb PC Convertible laptop system. With prices starting at \$1,995, the PC Convertible runs the PC-DOS operating system but uses 31/4-in. floppy disk drives instead of the 51/4-in. industry standard.

Keeping a close eye on IBM, other microcomputer manufacturers launched systems with increasingly better price/performance ratios and anxiously planned for the next generation of Intel 80386-based ma

While most large-systems vendors were slow in meeting customer demands for IBM PC-compatible workstations, they have learned their lesson this time around. In their efforts to become single-source suppliers, nearly all of the large systems manufacturers now have PC AT-compati-ble systems available to their cus-

Activity in the IBM Personal Computer-compatible laptop computer market also increased, with a number of vendors introducing systems with improved displays. Most prominent among those vendors were Data General Corp. and Zenith Data Systems Corp. Wang Laboratories, Inc. is also expected to announce an IBM PC-compatible laptop system by ear-

Meanwhile, Compaq shrugged off ersistent rumors that the company will soon be introducing a laptop system with a highly readable gas plasma display. What is lacking, Compaq officials maintain, is the technology to squeeze a full-function personal computer into a laptop-size

The only laptop system to achieve extraordinary sales so far is Tandy Corp.'s Model 100, a non-IBM-compatible system with a worldwide installed base of more than 135,000, according to IDC.

Typifying the industry trend, Cordata, Inc., a week after IBM's April announcements, added value to and cut prices on its PC- and XT-compatible systems and cut prices on its ATcompatible systems by as much as 33%. For example, Cordata slashed the price of one 640K-byte AT model with a 20M-byte hard disk drive from \$5,495 to \$3,695.

Citing tough competition and a desire to become a real factor in the marketplace, NEC Information



Bright is a Computerworld senior

Continued from page 41 Systems, Inc. in August followed suit by dropping prices on its AT-compatible systems by as much as 25%. Formerly \$5,045, an APC IV with

640K bytes of RAM and a 40M-byte hard disk drive is now \$3,995. The price cuts came after a steady de-cline in NEC's annual shipments from 13,500 in 1983 to 10,020 in 1984 and 9,130 in 1985, according to IDC figures.

ne new AT-compatible system that has received high marks for its price/performance ratio is Televideo Systems, Inc.'s Telecat-286. For \$2,995, the Telecat-286 comes with 512K bytes of RAM, selectable 6-MHz or 8-MHz clock speeds as well as a 20M-byte hard disk drive. A 77

Despite continued competition from low-priced clones, the threat of more powerful machines or anything Apple might do, the microcomputer world still revolves around IBM.

version with a 30M-byte drive is also

While the clone manufacturers were escalating their price war, Apple in September cut the prices of its Macintosh systems. The Macintosh Plus was reduced from \$2,599 to \$2,199, and the Macintosh 512K Enhanced dropped in price from \$1,999 to \$1.699

Deftly sidestepping the clone

price wars, Compaq catapulted into the Fortune 500 by sticking close to the IBM standard and at the same time adding extra value to its ma-

Tired of waiting for IBM, Compaq last month broke from that tradition by introducing an Intel 80386-based system before IBM did.

Targeted for such computation-intensive applications as engineering,

software development and large sortware development and large spreadsheets, the Deskpro 386 re-portedly runs existing Microsoft Corp. MS-DOS programs two to three times faster than an IBM AT.

Prices start at \$6,499 for a system with a 40M-byte hard disk drive and at \$8,799 for a system incorporating a 130M-byte disk drive.

In addition to a 16-MHz 80386, the Deskpro includes such improvements as static column memory and faster, higher capacity hard disk drives. However, no operating system yet exists to take full advantage of the 80386's advanced capabilities, such as addressing huge amounts of virtual memory.

o, for the time being, Deskpro 386 users must make do with the same MS-DOS that runs on ATclass machines. The system runs Mi-crosoft's Xenix V/286 version of Unix, which makes better use of the 80386 chip and which supports mul-tiple users. In early 1987, Microsoft is expected to have the Xenix V/386

But MS-DOS will be the dominant personal computer operating system on the Deskpro 386. "You'll continue to see DOS as the standard for individual personal computer applications, and you'll see various versions of Unix in the other segment, such as multiuser applications and [engineer-ing] workstations," said Compaq Marketing Vice-President Mike Swavely last July.

If IBM should come out with an 80386-based PC, then the Deskpro 386 would likely have to be re-engineered to ensure compatibility. Given that scenario, the Deskpro 386 might seem to be a rather risky proposition, but it is unclear when — or whether - IBM will announce such a machine

Meanwhile, a handful of other companies, such as Corvus Systems, Inc. and Advanced Logic Research, have already introduced systems built around the new chip.

In addition, Wyse Technology, Inc. and several other companies are be-lieved to have Intel 80386-based machines waiting in the wings. "Any-body who announces a 386 PC at this juncture, before IBM makes its move, should have their head examined, comments Marty Gruhn, vice-president of The Sierra Group, a market research firm based in Tempe, Ariz.

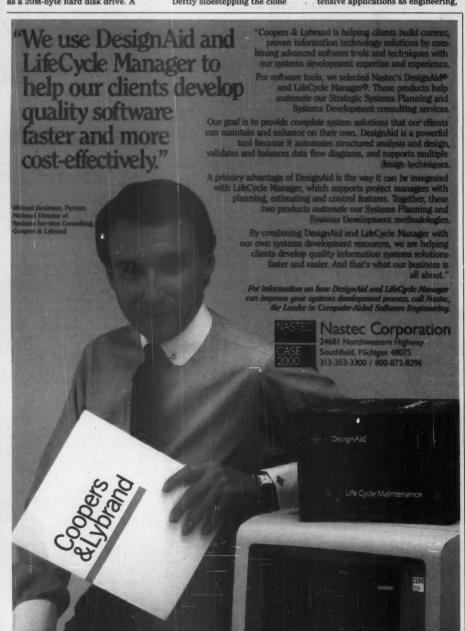
While it was challenging IBM with new technology, Compaq also contin-ued to strive for price/performance leadership against existing IBM ma-chines. One day after IBM introduced its \$3,995 XT Model 286, Compaq announced a comparably equipped machine for \$3,999.

At the same time, Compaq cut the price of its entry-level Deskpro 286 system by 25%, from \$3,999 to

According to Compaq's Swavely, the new Deskpro 286 Model 20 offers two key advantages over the XT Model 286: greater speed and a greater capacity for storage devices. Using an 8-MHz 80286 microprocessor with two wait states, the Deskpro 286 Model 20 should run approxi-mately 10% faster than the IBM system, Swavely claims.

The Compaq system has room for four storage devices, compared with the three available in the IBM system. One of those four devices

Continued on page 47



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#### Sun, Apollo, DEC face off in engineering workstation arena

By ROSEMARY HAMILTON

ince January, there have been dozens of products rolled out, revamped, repositioned or reduced in price in the engineering workstation market. And users are not likely to get much of a reprieve from this

With the recent introduction of a faster 32-bit microprocessor from Motorola, Inc. and the current development work under way for workstations expected to process at speeds in excess of 20 million instructions per second (MIPS), a new generation of products could be ushered in early next year.

The new chip, the Motorola 68030,

and the multiple MIPS machines will only fan the competitive fire that has been raging this year as Apollo Computer, Inc., Sun Microsystems, Inc. and Digital Equipment Corp. fight for market share.

In addition to these three vendors, there are a number of OEMs, such as Mentor Graphics Corp., Daisy Sys-tems Corp. and Valid Logic Systems, Inc., as well as other vendors - the most notable of which is Hewlett-Packard Co. - competing for market share, but the primary battle

Hamilton is a Computerworld se-

throughout the past year has evolved around the trio of Apollo, Sun and DEC.

And this battle has greatly changed the market in one year's time. A year ago, a typical worksta-tion cost between \$35,000 and \$50,000. Today, the three vendors offer workstations in the \$15,000 to \$40,000 range, although fully configured systems still cost in excess of \$50,000.

In addition, the most powerful general-purpose engineering work-station had a 1- to 2-MIPS rating a year ago. With the recent high-end workstation introduction from Sun, the new top rating for the generalpurpose workstation market is 4

One year from now, vendors are certain to have incorporated the new Motorola 68030 microprocessor in their workstation offerings. The chip, with an 8-MIPS rating, is reportedly twice as fast as the current high-end Motorola microprocessor. In addition, the Dana Group, a startup firm in Palo Alto, Calif., has plans to introduce a "personal supercomputer" for engineers in mid-1987. The workstation, which will reportedly process at a rate of 20 to 30 MIPS, is expected to be priced in the \$70,000 to \$80,000 range.

The workstation competition has been heating up since 1982, when Sun introduced its workstations for a market that had been pioneered by Apollo, which introduced the con cept of stand-alone systems dedicated to engineering tasks in 1980.

But the competition intensified in the early months of 1986. In Janu-ary, IBM made its long-awaited entry into the market with the announcement of the RT Personal Computer.

One week prior to the RT PC's introduction, DEC made a major push into the market with its Vaxstation II/GPX series, and Sun added a low-end model with a base price of \$7,900, one of the least expensive workstations in the industry. I than one month after the IBM RT PC announcement, Apollo came out with a number of new models that effectively replaced its existing line.

But the RT PC, much to the relief of other workstation vendors, re ceived a lukewarm reception in the market, and it was not considered a strong contender to offerings from Apollo, Sun and DEC.

The most significant event of 1986 was a nonevent — the introduction of the RT," said Richard Shaffer, editor and publisher of Technologic Computer Letter, a Technologic Partners newsletter. To hear most of the pundits talking. you would have thought that IBM was going to walk away with the workstation market the moment they decided to enter it. Lots of customers held off buying until they

saw what IBM was going to do. When they saw what kind of a turkey IBM really had in the RT, they went ahead and bought whatever it was they had planned to buy in the first

So the real fight, it seemed, would concern the workstation trio, and the three drew out their guns again at summer's end. Apollo, with its successful DN3000 color and monochrome models, was challenging Sun in the low end of the market, which had been Sun's stronghold. In August, Sun responded with a color low-end model to push back the color DN3000.

Along with the low-end model, Sun introduced a high-end system that was the first workstation to incorporate the Motorola 68020 microprocessor with a 25-MHz clock speed. A week later, Apollo introduced enhanced models at its high end. DEC, meanwhile, increased the standard memory configuration on some of its models and trimmed the prices on others.

Then in September, IBM added a number of enhancements to its RT PC in the areas of communications and storage and dropped the price to make it more competitive with other workstation offerings. Industry analysts considered this a positive step, but they also suggested that the RT is still not a serious threat to other workstation offerings.

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Continued from page 42 can be a backup tape drive, an internal option not offered by IBM.

Responding to customer demands, Digital Equipment Corp., Data General and Tandem Computers, Inc. all introduced AT-compatible workstations with the ability to link to those vendors larger systems.
With its \$4,065 Vaxmate

workstation introduced just last month, DEC strengthened its commitment to networking and finally provided its customers with a system conforming to the IBM Personal Computer stan-

The basic Vaxmate includes a built-in Ethernet connection and a Microsoft Windows interface for exchanging files with a VAX or with a Microvax system. An expansion box that has a 20M-byte hard disk drive is optional

77

Maintaining PC compatibility will soon become more difficult as IBM begins a se-ries of hardware and software improvements.

AT&T, Hewlett-Packard Co., Honeywell, Inc.'s Information Systems, NCR Corp., Sperry Corp. and Wang als offer AT-class systems with tie-ins to the vendors' proprietary minicomputers and mainframe

Although Burroughs Corp. has been successful with its B25 family of workstations, which run the company's proprietary BTOS multitasking operating system, the company may also be gearing up for some sort of AT-class device, hints Jim Smith, product marketing manager for workstations at Burroughs. So far, more than 56,000 B25 units have been installed, according to IDC estimates

A lthough an increasing-ly large percentage of hardware vendors currently lthough an increasingoffer IBM Personal Computer compatibility, maintaining that compatibility will soon become more difficult as IBM begins a series of hardware and software improvements.

Such improvements include use of the 80386 microprocessor, proprietary gate array chips and proprietary operating system additions to multitasking versions of MS-DOS

The IBM PC-compatible ranks will dwindle, with the only survivors being vendors like Compag and Tandy which have the financial means to keep pace.

#### Roundup '86 setup

his year's Hardware Roundup was compiled by Computerworld using questionnaires mailed to vendors of personal computers and small, medium-scale and large systems. Where possible, International Data

Corp.'s (IDC) definitions for these categories were used to place systems in groups with likely competitors. This week we conclude the Hardware Roundup with a look at microcomput-ers. The 32-bit workstations aimed at the technical/engi-

neering market are listed as a separate category in the microcomputer chart. In cases where vendors did not supply the requested information, Computer-world has filled in the world has filled in the blanks using earlier vendor literature or statements. Re-

sponses listed as "NA" are instances in which a manufacturer failed to answer a question or the question did not apply to a vendor's system. The survey primarily focuses on the major PC vendors and is not an exhaustive list.



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Apple Computer, Inc. 20525 Mariani Ave. Cupertino, Calif. 95014	Motorola, Inc. 68000	7.8336	Macintosh OS	512K-1M	400K-800K bytes	0	7	Monochrome: 512 by 342	\$1,699
Apple Macintosh 512K Enhanced									
Apple MacIntosh Plus	68000	7.8336	Macintosh OS	1M	800K bytes	0	7	Monochrome: 512 by 342	\$2,199
AYAY 1 Speedwell Ave. Morristown, N.J. 07960 PC 6300	Intel Corp. 8086	6	Microsoft Corp. MS- DOS	256K-840K	360K bytes (10M-byte hard-disk option)	7	2	Monochrome: 640 by 400	\$2,645
PC 6300 Plus	Intel 80286	6	MS-DOS, AT&T Unix System V	512K-7M	Two 1.2M-byte floppies (20M-byte hard-disk option)	7	2	Monochrome: 640 by 400	\$5,095
Burroughs Corp. 1 Burroughs Place Detroit, Mich. 48232	Intel 80186	8	BTOS	256K-1M	20M-160M bytes	0	4	Color, monochrome: 720 by 348	\$3,060
826									
827	80186	8	BTOS	512K-1M	20M-80M bytes	0	4 .	Color, monochrome: 792 by 480	\$2,895
828	80286	8	BTOS	1M-4M	20M-160M bytes	0	4	Color, monochrome: 720 by 348	\$4,695
Compaq Computer Corp. 20555 FM 149 Houston, Texas 77070	8086	7.14/	MS-DOS	128K-640K	20M bytes	4/6	1	Monochrome: 720 by 350	\$2,144
Compaq Desiquro Compaq Desiquro 286 Model 1	80286	6-8	MS-DOS, Mi- crosoft Xenix System V/ 286		20M-70M bytes	4/5	4	Monochrome: 720 by 350	\$2,999
Deskpro 286 Model 20	80286	8	MS-DOS, Xenix	640K-8.1M	1.2M-byte Roppy, 20M-byte heid disk	6	4	Monochrome: 720 by 350	\$3,999
Deskpro 386	Intel 80386	16	MS-DOS, Xenix	1M-14M	1.2M-byte floppy, 40M-byte hard disk (130M-byte hard-disk option)	5/6	4	Color, monochrome: 720 by 350	\$8,499
Compaq Plus	Intel 8088	4.77	MS-DOS	128K-640K	10M-byte hard disk	2	3	Monochrome: 720 by 350	\$3,199
Compaq Portable	8088	4.77	MS-DOS	256K-640K	Two 360K-byte floppies	3	3	Monochrome: 720 by 350	\$2,199
Compaq Portable II	80286	6-6	MS-DOS	256K-4.1M	10M-20M bytes	2	4	Monochrome: 720 by 350	\$3,499
Compaq Portable 286	80286	6-8	MS-DOS, Xenix System V/286	256K-2.6M	20M-byte hard disk	3	4	Monochrome: 720 by 350	\$4,299
Cordata, Inc. 275 E. Hillcrest Drive Thousand Oaks, Calif. 91360 Portable PC, Desktop	8088	4.77	MS-DOS	512K	Two 360K-byte floppies, 20M-byte hard disk	4	2	Color, monochrome: 640 by 400	\$1,495-\$1,99
PC series  AT Portable series	80286/	8	MS-DOS	512K	1.2M-byte floppy, 20M-byte	5	2	Color, monochrome: 640 by 400	\$2,995
AT Desktop series	80287 Intel 80287		MS-DOS	640K	hard disk  1.2M-byte floppy, 20M/40M-byte		2	Color, monochrome: 640 by 400	
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Data General Corp. 4400 Computer Drive Westboro, Mass. 01580	Intel 80C88		MS-DOS, Digital Re- search, Inc. CP/M 86	128K-640K	Up to 10M bytes	0/2	2	LCD display	From \$1,495
DG/One Models 1, 2		1	P 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			N. S.	300		
Dasher/One	Intel 8088-2	4/8	MS-DOS	256K-640K	720K-byte floppy, 10M-byte hard disk	3	1	Monochrome: 640 by 400	\$1,990-\$4,17
Dasher 286	80286	10	MS-DOS	640K-1.2M	1.2M-byte floppy	6	3	Monochrome: 640 by 350 (color option)	\$3,395-\$4,09
Digital Equipment Corp. 146 Main St. Maynerd, Mass. 01754 DEC Vaxmate	80286	8	MS-DOS	1M	1.2M-byte floppy (20M-byte hard-disk option)	NA	NA	Monochrome	\$4,065

The companies included in this chart responded to a recent written survey conducted by Computerworld. Further product information is evaluable from the vendo.

CM chart complied by Rechart Merchickland David Briefs.

External expansion box with five sicts available as an option.

\* Disk storage is expandable to include two floppy disk drives and one hard disk drive or one floppy disk and two internal hard disk drive

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Grid Systems Corp. 2535 Garcia Ave. Mountain View, Calif. 94043 Gridcase Model 1252	8086	4.77	MS-DOS, Grid-OS	128K-640K	720K bytes	Option <sup>1</sup>	6	Built-in LCD	\$2,595
Gridcase Model 1260	8086	4.77	MS-DOS, Grid-OS	128K-640K	720K bytes	Option <sup>1</sup>	6	Built-in gas plasma screen	\$3,125
Newietl-Packard Co. 1000 N.E. Circle Blvd. Corvalis, Ore. 97330	80286	8	Microsoft MS-DOS	640K-3.6M	1.2M-byte floppy, 20M-byte hard disk	7	1	Color, monochrome: 640 by 400	\$3,099
Vectra PC			24 35		<b>美国的</b>	(b)	- Physical		
HP Portable	80086	5.33	MS-DOS		1.28M bytes		2	LCD display	\$2,695-\$2,99
Contact local IBM sales representative Personal Computer	8088	4.77	PC-DOS	256K-640K	One or two 360K-byte floppies	5	NA	Color, monochrome: 640 by 350	\$1,495
Personal Computer XT	8068	4.77	PC-DOS	640K	360K bytes, 20M-byte hard disk	8	8	Color, monochrome: 640 by 350	\$2,895
PC XT Model 286	80286	6	PC-DOS	640K-12.6M	1.2M bytes, 20M-byte hard disk	8	8	Color, monochrome: 640 by 350	\$3,995
Personal Computer AT	80286	8	PC-DOS, Xenix	512K-15.5M	1.2M bytes, 30M-byte hard disk	8	8	Color, monochrome: 640 by 350	\$5,295
FTY Information Systems 2350 Qume Drive Sen Jose, Calif. 95131	8088	4.77	DOS	256K-640K	Two 380K-byte floppies-20M bytes	5	2	Color, monochrome: 720 by 348	\$1,395-\$2,34
ITT Xtra series									Interest
ITT Xtra XP series	80286	6	DOS		10M-20M bytes	5	2	Color, monochrome: 720 by 348	\$2,995-\$3,12
(multiuser systems)	80286	6/8	DOS, Xenix V.2	640K-16M	42M-144M bytes	9	Up to 8	Color, monochrome: 720 by 348	\$5,299-\$12,2
Kaypre Corp. 533 Stevens Ave. Solana Beach, Calif. 92075 Kaypro PC, PC-10	8088	4.77	MS-DOS	256K	Two 360K-byte floppies/20M-byte hard disk	9	2	Monochrome: 720 by 348	\$1,595-\$1,69
Kaypro 2000	8088	4.77	MS-DOS	768K	720K bytes	NA	1	LCD screen	\$1,995
Kaypro 286l Models A, C	80286	8	MS-DOS	512K-15M	1.2M-30M bytes	7-8	36	Monochrome: 720 by 348	\$2,495-\$3,99
Leading Edgo Hardware Products, Inc. 225 Tumplie St. Certon, Mass. 02021	8088	4.77	MS-DOS	512K	Two 360K-byte floppies (10M-40M-byte hard-disk option)	4	•	Color, monochrome	\$1,295
Model D				1					
MCR Corp. Personal Computer Division 1601 5. Main St. Dayton, Ohio 45479 NCR PC6 series	8088-2	4.77/8	NCR DOS	256K-4M	20M-40M bytes	8	2	Color, monochrome: 640 by 400	\$2,240
NCR PC4i series	8088	4.77	NCR DOS	256K-640K	Up to 10M bytes	8	2	Color, monochrome: 640 by 400	\$2.465
NCR PCS series	80286	6/8	NCR DOS, Xenix	256K-8M	20M-64M bytes	8		Color, monochrome: 640 by 400	
MEC Information Systems 1414 Massachusetts Ave. Busboro, Mass. 01719 APC IV	80286	6/8	MS-DOS, Xenix	10.5M	1.2M-82.4M bytes	8	5	Color, monochrome: 1,120 by 750	\$2,995
Panasonic Industrial Co. Two Panasonic Way Secaucus, N.J. 07094	8086-2	4.77/	MS-DOS	256K-640K	Two 360K-byte flopples <sup>2</sup>	6	1	Color, monochrome	\$1,295-1,49
Business Partner (FX-600)							1		
Business Partner 296 (FX-800)	80286	6/8	MS-DOS	512K-1M	Single or dual floppy disk drives	10	1	Color, monochrome	\$2,795-\$2,99
Senior Partner series	8088	4.77	MS-DOS	256K-512K	Single or dual floppy disk drives	2	2	Monochrome	\$1,495-\$2,7
Exec Partner (FT-70, FT-80)	8086-2	4.77/ 7.16	MS-DOS	256K-640K	Two 360K-byte flopples/360K- byte floppy, 10M-byte hard disk	1	2	Gas plasma display	\$2,595-\$3,7
Prime Computer, Inc. Prime Park Nettck, Mass. 01760 Prime PC Option	NA	4.77	MS-DOS	256K-640K	Single or dual floppy disk drives (20M-byte hard-disk option)	5	2	Color, monochrome: 720 by 300	\$3,595*

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	8	10 mg	Same.		1	1	No.		1
Sharp Electronics Corp. Systems Division Sharp Plaza Mahwah, N.J. 07430	8086	7.37	MS-DOS	320K-704K	360K-10M bytes	5	2	LCD display	\$1,795
PC-7000 Compact Personal Computer		100							
PC-7500 series	80286	6/8	MS-DOS	512K-1.2M	1.2M-40M bytes	8	2	Color, monochrome	\$2,995-\$4,99
Sperry Corp. P.O. Box 500 Blue Bell, Po. 19424 Sperry PC/HT	8088-2	4.77/ 7.16	MS-DOS	256K	360K-byte, 20M-byte hard disk	5	2	Color, monochrome: 720 by 350	\$2,995
Sperry PC/IT	80286	6/7.16/8	MS-DOS	512K-5M	1.2M-byte floppy, 40M-byte hard disk	8	3	Color, monochrome: 720 by 350	\$4,695
Tandy Corp. 1800 One Tandy Center Fort Worth, Texas 76102	8088	7.16/ 4.77	MS-DOS	384K-640K	Two 640K-byte floppies (20M-byte hard-disk option)	5	1	Color, monochrome: 640 by 400	\$1,199
Tandy 1000 SX Tandy 3000 HL	80286	8	MS-DOS,	512K-4M	Built-in 5¼-in. floppy reads 360K-	7	1	Color, monochrome: 640 by 400	\$1,699
rainay 55000 ris.	00200		Xenix	01211-4111	byte format4			color, morocatomo. 646 by 466	41,000
Tandy 3000	80286	. 8	MS-DOS, Xenix System V	512K	Built-in 5%-in. floppy	10	2	Color, monochrome: 640 by 400	\$2,199-\$4,29
Tandy 6000 HD	68000, Z-80A	.8	TRS DOS, Xenix	512K-1M	One floppy, 15M-byte hard disk	6	3	Monochrome: 80 lines by 24 lines	\$3,499
Televideo Systems, Inc. 1170 Morse Are. Sunnyvale, Calif. 94068	80286	6/8	MS-DOS	512K-640K	Up to 1.2M-byte floppy, 40M-byte hard disk	8	2	Monochrome: 640 by 400	\$2,695-\$3,96
Tolo-255 Models 1, 2									
Telecat-286 Models I, II	80286	6/8	MS-DOS	512K-1M	360K bytes, 30M-byte hard disk	5	2	Monochrome: 640 by 400	\$2,995-\$3,49
Texas Instruments, Inc. P.O. Box 809063 Dellas, Texas 79380	8088	NA	MS-DOS	128K-768K	360K bytes	NA	NA	Color, monochrome: 720 by 300	\$2,395
Texas Instruments Professional Computer									
Texas Instruments Business Pro	80286	6	MS-DOS	512K-3M	1.2M bytes	14	1	Color, monochrome: 720 by 300	\$9,185
Wang Laboratories, Inc. One Industrial Are. Lowell, Mass. 01851	9086	8	MS-DOS, PC- DOS, CP/M, UCSD p-sys- tem	256K-768K	360K/1.2M-byte floppy disk (10M- 67M-byte hard-disk option)	Up to 8	2	Color, monochrome: 800 by 300	\$1,940
Wang Professional Computer									
Wang Advanced Professional Computer	80286	8	MS-DOS, PC- DOS, Xenix, CP/M, UCSD p-system	512K-2M	360K/1.2M-byte floppy disk, (20M-67M byte hard-disk option)	8	2	Color, monochrome: 800 by 300	\$3,700
Zenith Data Systems Corp. 1000 Milwaukee Ave. Glenview, III. 60025	8088	5/8	PC-DOS, MS- DOS	256K-640K	Up to 360K bytes, 40M-byte hard disk	1-6	2	Color, monochrome: 720 by 350	\$1,299-\$1,9
Z-148, Z-158				24.3			1001		
Z-171, Z-181 portables	80088	4.77	MS-DOS	256K-640K		NA	2-3	LCD display	\$2,399
Z-241	80826	6	MS-DOS, Xenix	640K-2M	1.2M-byte floppy, 40M-byte hard disk	10	2	Color, monochrome: 720 by 350	\$3,499

#### **TECHNICAL/ENGINEERING WORKSTATIONS**

11	S. Marie Control of the Control of t	1			1	1	1/	1	1	1
Adage, Inc. 1 Fortune Drive Billerica, Mass. 01821 6500	Proprietary	40	1	1M-16M	105M	380M	Proprietary	Ethernet	Tektronix, Inc. 4014; Mac- Neal Swendler Corp. Anvil; Gecae International Ideas	\$38,000-\$60,00
Apollo Computer, Inc. 330 Billerica Road Chelmsford, Mass. 01824 Dornals Series 3000 — color	Motorola, inc. 68020	16	1.4	2M-8M	2M	8M	Domain/IX (Unix), Aegis	Domain, Ethernet, TCP/IPI, CCITT X.25	Phigs, Sigraph Core, Digital Research, Inc. Graphics Kemal System (GKS), (4014 emulation	\$9,900-\$14,900
Apollo Domain DN570, DN580	68020	16	NA	2M-16M	2M	16M	Domain/IX, Aagis	Domain, Ethernet, TCP/IP, X.25	Phigs, Core, GKS, 4014 emulation	\$29,900-\$43,90
DN570 Turbo, DN580 Turbo	68020	20	3.4	8M-16M	8M	16M	Domain/IX, Aegis	Domain, Ethernet, TCP/IP, X.25	Phigs, Core, GKS, 4014 emulation	\$43,900-\$57,90
AT&T 1 Speedwell Ave. Morristown, N.J. 07960 AT&T Unix PC Model 7300	Motorola 68010	10	NA NA	.5M	512K	2M	Unix System V (plus Microsoft Corp. MS-DOS with the AT&T DOS-73 board)	Starlan/Unix (multiuser)	Graphic Support Software (GSS) drivers built in	\$5,590
AT&T Unix PC Model 381	68010	10	NA .	Up to 2M	512K	2M	Unix System V (plus MS-DOS with the AT&T DOS-73 board	Starlan/Unix (multiuser)	GSS drivers built in	\$8,495-\$9,995



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Calcomp Co. 2411 W. La Palma Ave. Anaheim, Calif. 92801	68010/ 68000	10	1*	1M-6M	1M	6M	Unix System V with Berkeley 4.3 extensions	Ethernet, SNA Gateway	Proprietary	\$43,000-\$84,000
System 25 300 series, 600 series									Ministry and the	THE SHARE
Gaterity Computing 9692 Via Excelencia Sen Diago, Calif. 92126 C1200, C1230, C1260	Proprietary	40	8-20	4M-24M	140M- 337M	116-446	University of California at Berkeley Unix 4.2	Ethernet with TCP/IP, NFS, X.25, HASP, 2780, PC-Interface	stations with 2D, 3D capabilities	\$38,000-\$94,000
Convergent Technologies, Inc. 2314 N. First St. San Jose, Calif. 95131	68020	12.5	1.9	1M-16M	1M	16M	CTIX (Unix System V.3)	RFS, TCP/IP	CGI, GKS, Phigs	\$27,000
Allightystation I (graphics workstation)				1			- Mer Dis	A STATE		R. C. College
Mightystation II (graphics workstation)	68020	25	4	2M-64M	2M	64M	СТІХ	RFS, TCP/IP	CGI, GKS, Phigs	\$52,000
Bata General Corp. 6300 S. Syracuse Way Englewood, Colo. 80111 DS/7500	Proprietary		1 000	4M-10M	4M	10M	AOS/DVS, AOS/ VS, DG/4X	X.25, SNA, Xodiec, Ethernet	DG/GI, GKS, DG/GT	Monochrome \$15,900, Color \$25,800
Digital Equipment Corp. 146 Main St. Maynard, Mass. 01746	Microvax II	20	1-2	3M-5M	3M	5M	VMS, Unix 4.2 (Ultrix)	ISO (Decnet), TCP/IP	GKS, Core, Tektronix 4014 X-Windows, VWS	\$14,995
Vaxstation II/RC Vaxstation II/GPX	Microvax II	20	1-2	5M-16M	5M	16M	VMS, Unix 4.2	ISO (Decnet), TCP/IP	GKS, Core, Tektronix 4014	\$24.995
Vaxstation II	Microvax II	20	1-2	2M-16M	2M	16M	VMS, Unix 4.2	ISO (Decnet), TCP/IP	X-Windows, VWS	
							passana ago	iso (bediet), TCP/IP	GKS, Core, Tektronix 4014 X-Windows, VWS	8 26,000
Hewlett-Pacturel Co. 3000 Hanover St. Palo Allo, Calif. 94304 HP 9000 series	68020	16.67	1.5	Up to 7.5M	4M 48	7,5M	MS-DOS (option)	IEEE 802.3, Ethernet	VD-CGI, GKS, HP Display List (based on Phigs), HP Windows	\$15,600-\$54,800
900 King St. Rye Brook, N.Y. 10573	Proprietary	NA	1.6-2.1	1M-8M	1M	8M	AIX	Ethernet, TCP/IP, PC Net- work, Token-Ring network	IBM 5080 (GSL)	\$7,900-\$15,620
RT Personal Computer  Nesscomp Co. 1 Technology Parit Westford, Mass. 01886	68020	12.5- 16.7	1.6-2.5	2M-16M	2M	16M	FITU Unik	Ethemes, TCP/IP, X.25	Core, GKS, proprietary	\$14,000-\$32,000
MC5000 series				40	4 17					
Silicon Graphics, Inc. 2011 Stierlin Road Mountain View, Calif. 94043	68010	10	1	2M-8M	2M	8M	Unix	Ethernet with XNS or TCP/ IP, IBM 3270	Iris Graphics Library, GKS	\$24,900-\$59,900
iris 2400, 2500	-77			THE P	100					
Iris 3020, 3030	68020	16.67	1.8	4M-16M	4M	16M	Unix	Ethernet with XNS or TCP/ IP, IBM 3270	Iris Graphics Library, GKS	\$42,900-\$54,900
Sun Microsysteme, Inc 2550 Garcle Ave. Mountain View, Calif. 94043	68020	15	1.5	4M	71M	142M	Unix 4.2	Ethernet	GKS	\$7,900-\$13,900
Low End 3 Flush 50			13 2 2 2	10.2						
3-160C	68020	16.67	2	4M-16M	71M	1.3G	Unix 4.2	Ethernet	GKS	\$34,900-\$50,000
Tektrenix, inc. P.O. Box 1700 Beaverton, Ore. 97075 6130 Intelligent Graphics Workstation	National Semicon- ductor Corp. 32016	10	.6	1M-8M	20M	80M	Unix (proprietary version)	Ethernet	Tektronix 4100, 4120	\$9,950-\$20,000
		1265		- Value	S-3591	24.500.50	1360	79514 (1805)04 (1805)		

#### In Depth

## Cobol 85: Living in the shadow of 4GLs

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WHEN EQUAL MASTER KEY
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GET-TRANSACTION GET-MASTER
WHEN GREATER THAN MASTER-KEY
DO UNTIL TRANSACTION-KEY NOT GREATER
MASTER-KEY
OR END-OF-MASTERS—MASTERS

By LEMUEL SKIDMORE

wo contrary trends are coming to light in the DP world. On one hand, corporate installations make major investments in so-called productivity tools, such as fourth-generation languages and application generators, that may or may not serve their needs. On the other hand, Cobol 85, a recent ANSI Cobol standard that was quite controversial during its development, goes unnoticed in the mainframe world.

These two trends run contrary because the productivity enhancements that are the object of the first are provided by Cobol 85, the object of the second. Several writers make vague reference to the Cobol 85 productivity features, but none, to my knowledge, explains how these features rate such a label.

In order to explain this, we should first examine the concept of productivity. Programmer productivity should be measured in terms of the functioning applications delivered. This delivery is the end result of a lengthy process that includes analysis, design, implementation, training and, of course, programming. The programming part is at most 40% of the total effort.

If that figure seems unlikely, consider the truism that states that any programmer's time estimate should be multiplied by 2.5 to be realistic. The reason is that programmers consider only their 40% of the production process.

Productivity improvement in this area alone, therefore, yields little improvement in terms of the entire product. For example, a 100% gain in programmer productivity yields only a 20% gain in terms of the whole.

This may be either discouraging or enlightening, but the fact remains that analysis and design do not disappear when a fourth-generation language is introduced. What does happen is that the 40% of the process that is programming may be re-

duced, thus allowing more concentration on analysis and design and keeping the programming/reprogramming cycle from expanding beyond 40%.

#### Choice of tools

Since one objective of application developers is to improve productivity — that is, to deliver more functioning applications — the next step is the choice of a tool to improve productivity in the programming portion of development. Unfortunately, the first response has been to throw away the existing tool, Cobol, and replace it with some unknown, nonstandard, different-from-shop-to-shop fourth-generation language.

I am not criticizing fourth-generation tools. They have their place and will grow in importance. I am merely questioning the rejection of Cobol, a standard tool that is portable across the whole range of computers, known to most business application programmers and already owned by DP shops.

The decision to reject Cobol is even more questionable, given that its potential has yet to be tapped. In other words, why discard Cobol before learning to use it effectively?

The contention here is that, in terms of productivity in the programming portion of the development cycle, Cobol can be a useful tool. Furthermore, Cobol 85 can be a more useful tool than existing Cobol versions.

This being true, one would think that installations would jump at the chance to implement Cobol 85. But they are not for various reasons. First of all, only one compiler, that from Tandem Computers, Inc., is certified for high-level compliance to the ANSI 85 Cobol standard. High-level compliance means that the full range of Cobol 85 features are included. Micro Focus, Inc., Ryan-McFarland Corp. and others offer microcomputer Cobol compilers that have been certified at the intermediate level and

tool • Cobol 85's productivity enhancers: Evaluate and Perform

Where are all the

mainframe compilers?

• How to draw more

life from a familiar

About the author
Skidmore is founder of Skidmore Resource Management Co.
of Clinton, Conn., a consulting
and training firm serving the
IBM mainframe world. He is
also vice-chairman of ANSI Cobol Committee X314.

#### In Depth/Living in the Shadow of 4GLs

System programmers choose compilers for a variety of reasons, none of which has to do with the productivity of application programmers. These programmers are to be forgiven for that, because such productivity is not their concern.

include some but not all of these features. Where are all the main-

frame compilers? Their development has been delayed for a variety of reasons, all of which could be overcome by demand in the user community. There has been no outcry from users, because on the whole, few are aware of the new standard. The awareness that does exist is a pessimistic one. This is due in part to the misdirected controversy over Cobol 85,

turmoil that arose after the new language introduced features that made it incompatible with previous Cobol versions. Meanwhile, MIS departments chase the fourthgeneration-language rainbow, contradicting their mission of quality applica-

tions in less time.
Finally, the decision to procure a new compiler is almost always made by the wrong people. The wrong people include anyone outside the realm of application

development. Yes, system programmers need to be involved — a little — in the decision process, but they should not drive it.

#### The right decision makers

A Cobol compiler is a tool for application development. To allow anyone other than application developers to choose the tool is analogous to application developers choosing tools for users. The difference is that some application developers have learned humility over the years when insisting that they know what is best for their users.

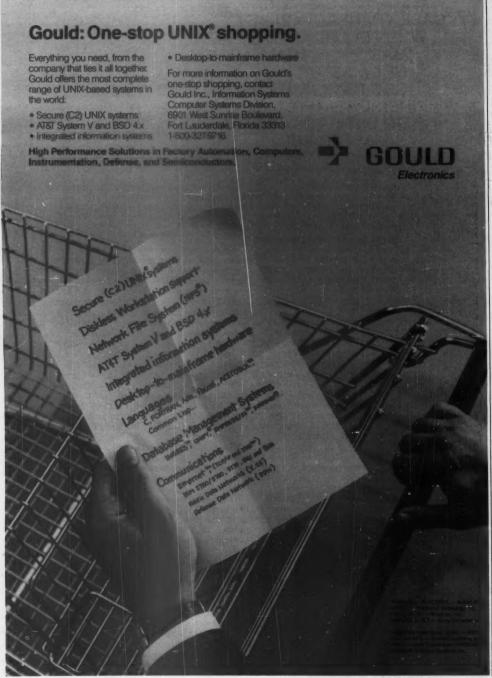
System programmers choose compilers for a variety of reasons, none of which has to do with the productivity of application programmers. These programmers are to be forgiven for that, because such productivity is not their concern. Instead, their concerns include such technical issues as choosing to convert from Cobol 68 to Cobol 74 because of the latter's additional file

management capabilities. Very few application pro-grammers were (or are) even aware of the differences between these two earlier ANSI standards. If the choice to upgrade had been made in an appropriate area, it would have given the applications side of the house the opportunity to evaluate the significant improve-ments in Cobol 74. Instead, the bad habits of 20 years ago live on in programs being developed today.

To use a more current example, IBM's latest MVS Cobol compiler, VS Cobol II, contains many of the productivity enhancements of Cobol 85. Although IBM does not, as of this writing, offer a certified Cobol 85 compiler, MVS users could be taking advantage of these facilities

In the majority of shops I am aware of, the acquisition of VS Cobol II is treated as a technical issue because it is the only compiler that supports the 31-bit addressing scheme of MVS/XA. The de-cision to implement VS Cobol II, which was announced in 1984, is therefore held hostage by system programmers with the justification that the compiler is unnecessary, at least until the conversion to MVS/XA and then only when Cobol applications need to address areas beyond the 16M-byte line.

All of these issues work together to keep Cobol 85 out of a very important marketplace — the mainframe world. That is a problem because of the significant im-provements in the new standard. How do these improvements increase pro-ductivity? By compressing the development cycle and thereby shortening the programming part of the cycle. To explain how this





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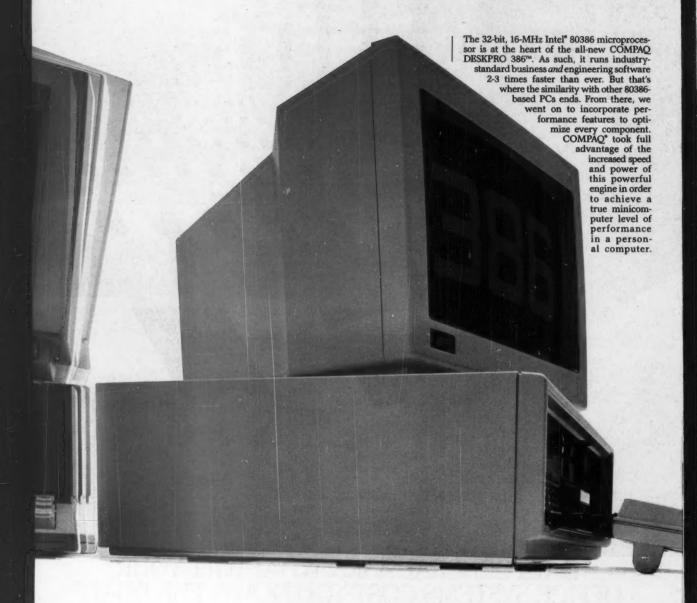
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#### In Depth/Living in the Shadow of 4GLs

STERENCE ON-RECO STERENCE OF MATE-MASS ANSACTION GET-MASTE ANSACTION GET-TRANS EATER THAN MASTER-KEY L TRANSACTION-KEY NOT ER-KEYT GREATER THAN 77

The claim that a switch from current Cobol to Cobol 85 represents a leap of the same order of magnitude as that from assembler to Cobol invites potshots from all types of development people, from those who believe that assembler is the language of the future to those who think that Cobol is dead.

compression is accomplished, let me explain a development philosophy. In the mid-1970s, I was writing macro-level IBM CICS applications in assembler. These applications were developed in a structured fashion, even though the term "structure" is very rarely used in the same sentence with CICS, let alone macro-level CICS, let alone macro-level CICS written in assembler.

#### 'Think Cobol'

The structure of the application development was enforced by my mentor, who said. "Think Cobol, write assembler." My mentor meant by this that one should think in higher level terms - design terms — and implement the higher level construct in the source language. Keeping that concept in mind, I later taught structured Cobol to students by urging them to think pseudocode, write Co-bol, pseudocode being the de-sign code one would use to specify write a program that would later be written in another language such as as-sembler or Cobol. Again, the idea is, think at the design level, work at the coding lev-

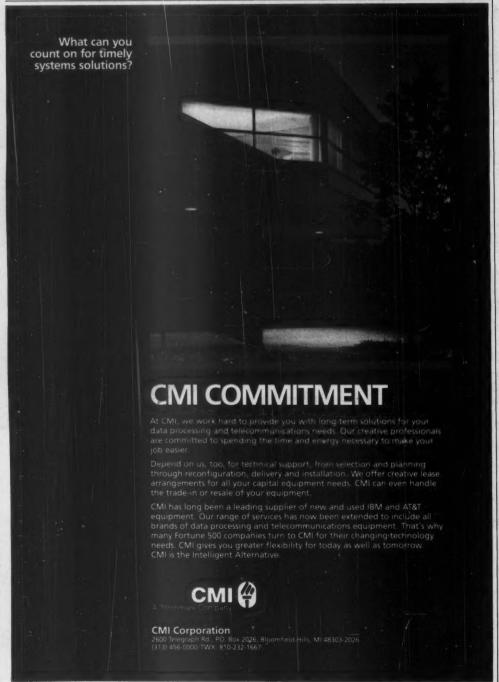
The move from assembler to Cobol represents a productivity enhancement because it is compressed; that is, one step was removed from the development process. Using the structured programming features of Cobol 85, it is possible to code constructs that look like pseudocode. Please note that many Cobol programmers, on the contrary, think assembler and write Cobol — thus the preponderance of nonmaintainable Cobol programs.

Now, the process is compressed further. The programmer can think in terms of a higher level tool (such as a structure chart) and write pseudocode. The difference is that the pseudocode in this case is standard Cobol.

The claim that a switch from current Cobol to Cobol 85 represents a leap of the same order of magnitude as that from assembler to Cobol invites potshots from all types of development people, from those who believe that assembler is the language of the future to those who think that Cobol is dead. Both extremes, however, are equally wrong. What makes anyone think that new tools alone will solve the productivity crisis? We have not even learned to use and to keep up with the tools we have, let alone been able to adjust to a multiplicity of nonstandard tools.

#### Enabling compression

Cobol 85 is full of features that enable the sort of compression discussed above. Three features will be discussed here, not to teach Cobol 85 or to recommend a specific structured



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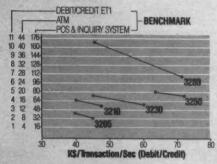
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#### In Depth/Living in the Shadow of 4GLs

technique, but to illustrate my point. They are the EVALUATE verb, the in-line PERFORM and the explicit scope terminator.

These features are not new. Many compilers have contained them for years. In the IBM world, they are available in DPPX Cobol. for the 8100 series, in VS Cobol II for mainframes under MVS and in various compilers for the IBM Personal Computer and com-

My earlier point, that Cobol 85 constructs are close to pseudocode, depends, of course, on the seudocode one uses, but pseudocode one uses, but let me illustrate from my own experience.

The chart shows two examples of a specifica-tion for a two-file match One is pseudocode intended to be translated to a version of Cobol that lacks the three aforementioned features. The other is standard Cobol — Cobol 85. It does not matter what detail-design tool one uses — pseudocode, flow chart, Chapin chart and so on. Any tool at the detail level can be discarded if the source language is Cobol 85. The point is that the two are very

In the first case eudocode - translating to old Cobol code would require such glaring deviations as an IF-ELSE construct to replace the CASE statement and the invocation of separate proce dures replacing the DO-LOOPS

Two issues are important here. First, the translation of pseudocode to Cobol may seem trivial, but it is not. In fact, most programming errors are caused by attempts to code around design flaws rather than to correct designs. The inclusion of the additional pseudocode to Cobol conversion, while necessary, results in one more

#### Old Cobol vs. Cobol 85

#### seudocode (Old Cobol)

TWO-FILE-MATCH SE TRANSAC WHEN EQUAL I MASTER — T MASTER - TRAN GET-MASTER GET-TRANSA CET-MASTER
CET-TRANSACTION
WHEN GREATER THAN MASTER-REY
DO UNTIL TRANSACTION-NEY NOT GREATER THAN
MASTER-REY
OR END-UF-MASTERS
UPDATE-MASTER
BIND-DO
WHEN LESS THAN MASTER-REY
OSCORD, EDDON

MASTER: D MASTER-FILE ASTERS IS THUE

TRANSACTION: D TRANSACTION-FILE

FND-TWO-FILE-MATCH

#### Cobol 85

#### TWO-FILE-MATCH

ED TO MASTER-RECORD

READ MASTER-FILE AT END SET END-OF-MASTERS TO TRUE

EAD TRANSACTION-FILE AT END SET END-OF-TRANSACTIONS TO TRUE.

Translating from pseudocode to old Cobol source code requires an extra step in the programming process. This translation creates an additional place in which errors might occur. Cobol 85 allows a compression of the programming process, reducing or eliminating that extra step

place in which error can be introduced.

The second issue is that the Cobol 85 code is followed more easily, is more readable, does not have to be converted and keeps control flow before the eyes of the programmers and the mainenance person.

In the second case - Co-

bol 85 — the new language elements, which accomplish the compression of Cobol to pseudocode, are the in-line PERFORM and the EVALU-ATE statement. The in-line PERFORM eliminates the need to reference a paragraph name. Besides immea surably increasing readability, this feature ends the need

to hold several places in a

source listing at once.
The EVALUATE state ment directly maps the CASE statement. This eliminates the need for complex IF-ELSE structures. A simple selection mechanism causes more migraines than any other feature of old Cobol

The issue of scope termi-

nation is addressed only obliquely in this example Notice the relative lack of periods, the old way of ending the scope of a statement. The END-IF terminator is useful in many additional ways and its use, along with the power of EVALUATE, will end both paranoia about nested IFs and the use of overly complex IF-nests.

The main advantage here is that an entire step is either reduced to triviality or eliminated by the implementation of Cobol No matter how infatuated one is with fourth-generation languages, the proven ability of Cobol to deal with complex applications, coupled with the proven tendency of fourth-generation languages to increase in complexity at a greater rate than the complexity of the applications, should indicate that Cobol in general, and Cobol 85 in particular, deserve a closer look

This scrutiny should be made with the eye of an application developer and from a productivity standpoint. Only then can an installation be sure of implementing a common, standard, proven tool

This article is not intended to present an exhaustive demonstration of the features of Cobol 85. Rather, the features of Cobol 85 are presented within the framework of productivity. Bad design will hamper Cobol 85 as they do old Cobol and fourth-generation languages. With Cobol 85, DP shops

can use a familiar tool in new ways, reduce the amount of time spent programming and produce code that is closer to the design than was previously the case. Thus, like fourth-generation languages, this tool allows the developer to spend more time on design.

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#### In Depth

## Becoming a technical leader

Can you say 'computer' and 'problem' in the same sentence?

How to crystallize system requirements • Forging alternate solutions • Obstacles: self-blindness, 'No-Problem' Syndrome and one right answer By GERALD WEINBERG

nough of theory: What you are actually doing that either makes you creative or blocks your brain? Can a new model of leadership really work for you, or is it only as useful as the latest diet fad? The theory of dieting is simple enough: All you have to do is achieve a balance between input and output. According to the balance theory, I should not have this bulge around the middle, but look at me.

Theories are like that. I can give you all sorts of techniques for developing your problem solving or leadership abilities, yet find that you are making no progress. In this article, I would like to explore the most common obstacles to progress toward problem-solving leadership, starting with the question why I sometimes put on pounds

without knowing why.

Keeping trim is important to my business because people pay more attention to what you do than what you say. As a consultant who is supposed to help streamline organizations, I make a poor model if I'm not exactly streamlined myself. At one such organization, my wife Dani and I were looking for the source of diminished productivity. After we spent the day observing and interviewing, Shirley, the manager of the organization's systems analysis sections, invited us home for dinner.

#### What did you eat for dessert?

Shirley and her husband, Harrison, lived with their three sons in a busy but attractive neighborhood, which seemed well matched to Shirley's temperament. When I raided Shirley's refrigerator for a predinner snack, I was surprised to find evidence that she was struggling to control her weight. There were low-cal foods inside, calorie charts on the door and a box of appetite suppressants on top. As she prepared supper, we discussed our common problem.

"I must have a metabolic problem," I said.

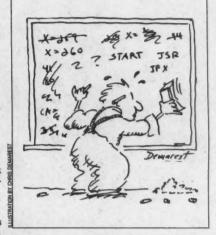
"Me, too. I used to have trouble with snacks, but I've controlled that, yet I still can't lose weight."

"Maybe it's eating out. You know, Dani and Harrison have already promised the kids we'll go out to Swenson's after dinner. I'd rather stay home because I can't resist their ice cream."

"Well, I can resist," Shirley boasted. "I'll just have a cup of coffee."

"Maybe if I eat a full supper," I said, "I won't have any appetite for dessert." But there wasn't much conviction in my voice.

I ate a full supper, but at Swenson's I wasn't able to resist ordering a dish of raspberry sherbet. Dani had a small marsh-



mallow sundae, Harrison had a large banana split, the two oldest boys had special children's sundaes, and the youngest had a chocolate chip cone. Only Shirley resisted, righteously and vocally ordering a cup of coffee. I noticed, though, that Shirley took cream in her coffee. And sugar.

Then when Buddy's cone arrived, Shirley seemed quite concerned that it was going to fall or drip. "I'll just trim off the extra," she announced, and proceeded to reduce Buddy's scoop to half its original size.

Somehow, the excess went into her mouth.

In the meantime, Harrison offered her a "taste" of his banana split. "Just a taste," she said, but he insisted that she taste each of the three delicious flavors, plus each of the three syrups, some of the whipped cream, a bit of the banana and both cherries.

Before long, the dish was resting halfway between them, and she was using her coffee spoon to continue her "tasting."

She also sampled the other two children's sundaes, nobly eating the parts they didn't like. To wash all this down, she ordered a refill on coffee, then another, both with cream and sugar.

Somehow, there seemed to be a food magnet in her mouth, irresistibly attracting all loose food on the table. I found myself compelled to offer her some raspberry sherbet, but she was busy finishing one of the decorative cookies.

Later that evening, with the kids tucked into bed, we four adults sat around having a nice chat. Around eleven, Shirley asked if anyone was hungry. None of us were, but she slipped into the kitchen anyway.

When she returned with a plate of cheese, fruit and nuts, she announced, "Well, you guys all had ice cream,

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#### In Depth/Becoming a Technical Leader

and I didn't have any."
"But you did," I observed, regret-

ting it immediately.

Shirley regarded me with a puz-zled look. "No. Don't you remember? I didn't order any ice cream. Just coffee." True, she had not ordered any ice cream, but didn't she realize that she'd eaten at least twice as much as anyone else at the table?

#### Self-blindness

For many people, work is like Shirley's eating. They waste time pursuing dead ends, dragging out phone calls or getting involved in useless arguments, yet never realize why they do not accomplish anything. Writers, for example, throw away many false starts or sit staring at a page without typing a single word. Many programmers, stuck in some fallacious argument, search for a single error long past the point where they should seek help. I know that other people do those

things (Dani and I watch them all the time), but I am sure that I do not do - not very often, anyway. Wouldn't I remember if I did?

In fact, I would not remember, any more than Shirley could remember what she had for dessert. Like everyone else, I am quite unable to see myself in action, particularly when I am exhibiting my least productive behaviors.

Whenever I watch someone like Shirley not watching herself, my consciousness is raised, for a few days at least. I snack less and lose weight. But soon I stop watching again, and my spare tire starts to inflate. What I need is a consultant, someone to watch me eat and report to me what I cannot see for myself. The same is true for all of us. The only way we can see ourselves is through other people.

The inability to see ourselves as others see us is the number one obstacle to self-improvement. The great majority of would-be problem-solving leaders are stuck on this one obstacle. To surmount it, they must recruit others to help them. Probably the best way to get someone to watch you is by making a pact to watch that person in return. Even a mutual serving relationship is a rather delicate one, so it may take some time to develop a relationship that works well.

Whatever you do, keep it mutual. Don't ever volunteer your observa-tions about people as I did with Shirley, no matter how helpful you think would be for them. Shirley was nice enough not to punch me, but I was lucky.

Even when people ask for your observations, they will not always like what you have to say. I once asked Dani to watch my eating patterns. As an anthropologist, she's an expert observer — so good, in fact, that it almost broke up our marriage. It's just not much fun to be watched all the time, so whatever you do, do not pick your spouse as your watching partner.

#### No-Problem Syndrome

On the same trip that we visited Shirley, I encountered an example of the second obstacle that interferes with every effort to become a more effective problem solver. I call it the No-Problem Syndrome. I was in Sacramento, Calif., addressing the local chapter of the Data Processing Management Association. I began my address by talking about a previous

77

The inability to see ourselves as others see us is the number one obstacle to self-improvement. The great majority of would-be problem-solving leaders are stuck on this one obstacle.

visit to Sacramento 25 years earlier. It was my first business trip as a new employee at IBM, a visit I will never

The California state legislature had just passed a law allowing let-ters as well as numbers on license plates. Opponents of the law had argued that certain combinations of letters might prove offensive. The

bill's backers promised to cull all

offensive letter combinations from

the plates, but they had no particular plan as to how to go about this. Somebody told them that a computer would be a big help, so they called IBM. That is where I came in.

I was a fresh young IBMer, all suited up and ready to purge the world of dirty words with a whizbang computer program. Unfortunately, the people from Motor Vehicle Registration had at least three requirements that I could not possi-

bly satisfy:

Some "offensive" words were not words in English but only looked like words in English. To understand this problem, drop one letter from your favorite four-letter expletive. Sometimes the new word is innocuous, but other times it is as offensive as the original.

· California had many ethnic groups speaking many different languages. The program was supposed to get rid of anything that might be offensive to anybody speaking Spanish, Chinese, Hebrew, Yiddish, Greek, French, Armenian and a few others I can't remember.

• We also had to remove words

that might someday be offensive to anybody speaking any of these or any languages of anyone who might visit California.

I told the license plate story to



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## uter almost defies description.

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kick off a discussion of what makes problems diffcult to solve. Then I distributed a set of problems for everyone to try. As I circulated through the room to see how everyone was doing, I noticed one man sitting conspicuously with his arms folded tightly across his chest.

"Have you finished already?" I asked him.

"No," he said. "I'm not doing them. Why waste my time? Why don't you just hurry up and tell us what it is you're trying to tell us?" "I can't tell you," I said, "because I want you to feel the frustration of

trying to do certain kinds of difficult problems. Telling you just isn't the

"Well, you might as well tell me," he countered. "because I can solve any problem you can give me. In fact, your 'unsolvable' license plate prob-

NPS seems to affect a large percentage of computer professionals. Whenever they hear the words problem' and 'computer' in the same sentence, they launch into a diatribe . . . And it always starts with the words, 'No problem.

lem is actually trivial."
"Trivial?" I asked.

"Absolutely. With modern technology, all you need is a big dictionary. You pass the combinations of letters against the dictionary and eliminate the ones you don't want. It's just no problem."

My first instinct was to argue. I might have asked him how he was going to get a dictionary of words

that had not been coined yet. Or why you would bother with a computer, once you had constructed a dictionary of offensive words. Then I realized that the poor man was suffering from a severe case of No-Problem Syndrome, or NPS for short. I had suffered from this disease myself, so I had nothing but sympathy for the poor man. I don't get any kicks out of attacking the handicapped, so I simply smiled and walked away.

Perhaps you have never heard of NPS? I have not checked this with any neurophysiologist, but it seems to be a condition in which the ears are not properly connected to the brain. The sounds enter, but they trigger a sterotyped response that has nothing to do with their meaning. One person describes a vexing problem, but the other merely responds with a callous "No problem."

No-Problem Syndrome is not the same as deafness. In fact, deaf people couldn't have NPS because the response has to be triggered by the key word "problem" reaching the ear. Once that word registers, the ears become selectively deaf, the first stage of the syndrome. The second stage seems to be the mental retrieval of some favorite solution method, which is immediately presented to the talker, even if it is necessary to interrupt him.

My uncle Max had NPS, and his favorite solution had to do with re-storing the practice of beating children in the public schools, much as he beat his children at home. If the economy was down, it was because they don't beat kids in school any more. If crime was up, or the weather was bad, it was the same reason.

Like most kids, I didn't understand the heartbreak of NPS. I used to laugh at my uncle, never dreaming that NPS might be hereditary. Because I lacked self-awareness, it was not until after my first visit to Sacra-mento that I found out the tragic news: I had NPS myself.

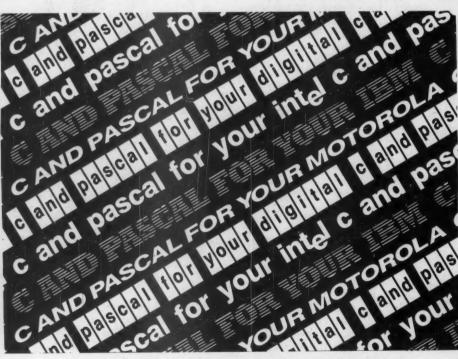
It was the license plate problem that revealed my terrible secret. The motor vehicle people told me about their requirements, but evidently their words never registered in my brain. Before they had finished talking, I had assured them that there was no problem. Before I understood what their problem was. I had managed to write a program to solve it.

You can imagine what a blow it was to a young IBMer when a bunch of civil servants rejected all his brilliant work. On the other hand, you can imagine what a blow it was to them when a young IBMer, not even listening to their requirements, told them they did not really have a problem. It may be terrible to have NPS, but it is even worse to be in contact with one of its victims.

I used to think that computers emit some nerve-damaging high-fre-quency sounds because NPS seems to affect a large percentage of computer professionals. Whenever they hear the words "problem" and "computer" in the same sentence, they launch into a diatribe that would put old uncle Max to shame. And it always starts with the words, "No problem."

As I grew older, however, I realized that computers themselves do not actually cause NPS. Perhaps it is the fast pace of the industry, which reduces the likelihood that problem solvers will take time to be aware of what they are doing. Besides, I have noticed that NPS afflicts people in all high-tech industries, so it cannot just be computers. It also affects quite a few people in low-tech industries, or people not in industries at all.

My own symptoms have abated a bit with age, so perhaps the problem is simply a manifestation of the youthfulness of the computer industry. Other than senility, though, I do



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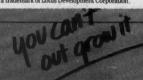
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# In Depth/Becoming a Technical Leader

The central dogma of academic psychology is: There is one and only one correct solution to every problem ... For a would-be problem-solving leader, belief in the central dogma is a debilitating disease and the third great obstacle to becoming a star problem-solving leader.

not know of any cure for NPS. I wish I could help these poor handicapped souls, but bitter experience has taught me that I would have more success going to Sri Lanka to cure lepers

People who have problems for others to solve should be better informed about the perils of NPS. Because it cannot be cured, they had better learn to protect themselves through my four-step plan for early NPS detection:

1. You describe your very

difficult problem.

2. The respondent says, 'No problem.

3. You say, "Oh, that's terrific. Could you please de-scribe my problem that you're going to solve?"

4a. If the respondent then

describes your problem, even erroneously, it is not a case of NPS but only a case of Enthusiasm.

4b. If the respondent describes a proposed solution to your problem rather than the problem itself, then sadly it is NPS. The kindest thing you can do for all con-cerned is smile and walk briskly to the nearest exit.

Sometimes the four-step detection plan can be used for self-diagnosis, but if the NPS is too far advanced, the plan will not work. To detect your own NPS, you have to be able to hear yourself say, "No problem." or or at least hear yourself giving solu-tions before you have confirmed that you understand the other person's problem. But, alas, terminal NPS patients cannot hear other people very well; and they cannot hear themselves at all. They are not only self-blind, they are self-deaf.

### Single-solution belief

We could characterize NPS as the unshakable belief in your own master intelligence. This definition makes it clear why NPS is the num-ber two obstacle to becoming an innovative leader. The Chinese say that the first step to knowledge is a confession of ignorance. If you already know everything, how will you ever learn anything?

Even though you should not believe you know every thing, it does help to know something. Nobody denies that good problem solvers have to be intelligent, but lack of intelligence is not one of the three big obstacles. We all know many high-IQ people who are not good at solv-ing real-life problems. Perhaps we ought to be more skeptical about the proce dure by which psychologists identify intelligence.

Recently, a science maga-zine ran a "Mind Benders" column prepared by Mensa, an organization of people who score in the top 2% on standardized IQ tests.
Among the Mind Benders
were the following two questions, which bent my mind in a direction perhaps not in-tended by Mensa.

1. All the secretaries in my office are under 21. All the young ladies in my office are very beautiful. My secretary has long blond hair and

blue eyes.
Which statement(s) below can be justified by the information given?

a) My secretary is under

b) My secretary is a beautiful young lady.
c) Neither of the above.

d) Both of the first two.

In a certain field, there are both horses and men. There are 26 heads and 82 feet (or hooves) in the field. How many men are there? How many horses?

Here are the answers: 1. The "correct" answer is given as (a) my secretary is under 21. What's supposed to trip you up is the assump-tion that all secretaries are female, which is not stated. But what about the assumption that my secretary is in



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# In Depth/Becoming a Technical Leader

my office? It does not say that, but then it does not say my secretary is

Depending on which set of assumptions you choose, all four answers are possible. Although I've never personally had a male secretary. I have worked in situations where my secretary was in another office, even in another city. Does this make me less intelligent than the psychologist who posed the ques-

2. By simple algebra, you get the official answer (15 horses and 11 men) if you assume that each horse has 4 feet and each man has 2. I don't know much about horses, but I read this test after watching a Veterans Day parade. It was obvious to me that one possible solution is 16 horses and 10 men, one of whom is a Vietnam veteran with no legs. Of course, there are lots of other solutions along this line, if you are not a psychologist

Any intelligent being who has been exposed to this sort of testing has experienced the same frustration: You can think of several possible answers, but you know the psychologists want only one; and you are not allowed to ask questions

It is not so bad when the questions are in a magazine just for fun or even in the Mensa admission test. But what if you want to get into college, or get a job or get into a favored track in the second grade? The psy chologists hold the power to keep you from getting what you want, and their power is unquestionable.

Quite possibly, academic psychology is the most arrogant profession of all time. We already encountered the central dogma of academic psychology: There is one and only one correct solution to every problem and the psychologist knows it.

This dogma applies equally to tests for people or mazes for rats. Any rat who displays a modicum of suspicion for the psychologist's set-up runs the maze a little slower and is labeled less intelligent. To me, anyone who fails to be suspicious of psychologists' experiments should be

labeled less intelligent.

The central dogma is damaging enough to the individual person or rat trapped by the psychologist, but its long-range effects on society may be even worse. Schools and employers reward people whose thinking happens to match the thinking of psychologists, so people either learn to think that way or find themselves out in the cold. After a while, we find people in problem-solving situations who literally believe that every problem has one and only one solution, a solution so inevitable that they will recognize it when they find

For a would-be problem-solving leader, belief in the central dogma is a debilitating disease and the third great obstacle to becoming a star problem-solving leader. Infected designers rarely consider an adequate

number of alternative designs and never consider testing the design other than by their own intuition. Infected programmers are powerless in the face of a bug that deviates in any way from the obvious answer.

Managers infected by the central dogma act like psychologists; they assign work to their subordinates and expect to have it done in one right way — their way. Before long, they create another generation in their own image.

### A closed system

They're worth summarizing, these three great obstacles to innovation:

· Self-blindness, concealing these three great obstacles to innovation.

• No-Problem Syndrome, convincing you that you already know the answer to all problems.

• Belief in the central dogma of

academic psychology, blinding you to alternative solutions, even ones you could generate without help from anyone else.

These deeply imbedded obstacles form a closed system, standing in the way of their own removal. People who are self-blind might read this list and nod their heads in agree ment, but about other people. People who suffer from NPS will not even read the list in the first place. People who believe the central dogma will already be on what they consider to be the one and only path to success.

So let's bid those people goodbye and concentrate on those for whom there is still some hope. Let's stick with you creative people who know the double enjoyment of watching what you are doing while you are doing it and laughing at yourself while you watch.



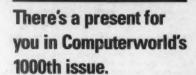
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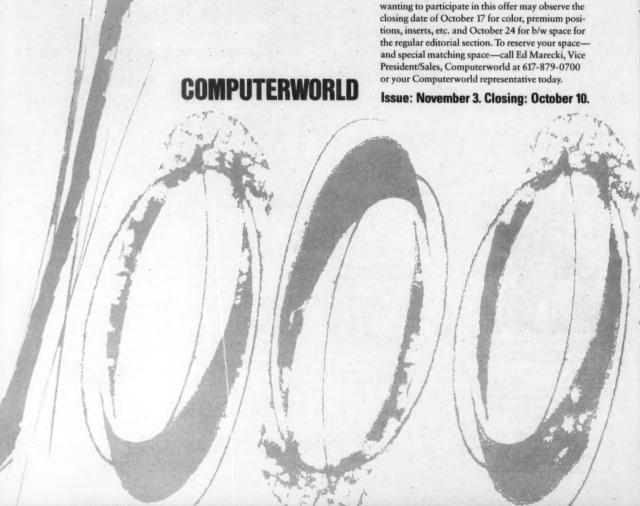
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# In Depth

# By JEAN BOZMAN

ive years ago, Chrysler Corp. was given just months to live by automotive industry analysts. Its sales were poor, it suffered billions of dollars in losses and analysts said its latest models were hard to distinguish from competing vehicles built by General Motors Corp. and Ford Motor Co.

Those were Chrysler's darkest days, just before the federal government approved a \$1.2 billion loan guarantee to save the company from bankruptcy. It was also when Chrysler's computer planners decided to spend tens of millions of dollars on sophisticated computer systems.

# 77

'Every day, 800 people use the system to generate realistic-looking models of a car that doesn't exist. You can show these prototypes to top management, and they can pick which cars they like.'

> - Glen Bibbins Chrysler Motors

The huge planned expense, which would carry the company well past the first scheduled loan repayment in 1990, was more strategic than ironic. Building on a base of more than a dozen Control Data Corp. mainframes, computer planners began to devise a strategy that would one day incorporate end-to-end computer-integrated manufacturing (CIM) and lift Chrysler out of a hole and into a competitive position.

Building such a powerful computer resource was Chrysler's way of saying that it intended to stay among the top three U.S. car manufacturers, alongside GM and Ford.

By 1985, the company had bounced back, aided by falling interest rates, a rebounding economy and solid sales based on a stronger product line. Chrysler, with \$21 billion in sales, ranked 13th in the Fortune 500 industrials last year, its revenue equal to about half that of Ford and less than one-quarter that of GM.

### Four computer centers

The repository of all the hardware at Chrysler is the Technical Computer and Instrumentation Center, located just blocks from the company's administration building and Chairman Lee Iacocca's offices. Chrysler has

Bozman is a Computerworld contributor based in Chicago.

# Chrysler Motors: Using 30 Cybers to bounce back



Robert Brauburger of Chrysler's Technical Computer and Instrumentation Center.

amassed 27 of CDC's Cyber 180 mainframes in its 36,000-sq-ft computer room at the Highland Park, Mich., facility and three more out in the field.

"From 1979 to 1983, the company spent the money on technology when they weren't spending it on anything else," says Robert Brauburger, chief engineer at the Technical Computer and Instrumentation Center. Software design accelerated anew in 1981, just as Chrysler approached bankruptcy. But the financial picture improved considerably by 1983, when Iacocca was able to hand over Chrysler's first repayment of the federal loan.

Later that year, Chrysler ordered a new CDC Cyber 205 supercomputer worth more than \$10 million. In 1984, the company added nine more CDC mainframes at a total cost of \$11.5 million.

# More than a sandbox

The massive computer room impressed visitors, but many observers inside the company saw it as an unjustified expense during lean years. "Some people thought it was a sand-box for us to play with," Brauburger says. "But it wasn't. We designed cars with it."

The Technical Computer and Instrumentation Center is one of five primary computer centers within Chrysler. Three are IBM shops devoted to handling customer orders, accounting, purchasing materials and administration in the Detroit area. Among the IBM mainframes Chrysler owns are several 3090s running IBM's MVS/XA operating system and DB2 relational data base management system. An IBM 4381 at the Technical Computer and Instrumentation Center acts as a link between the CDC world and the IBM Systems Network Architecture (SNA) world.

"We use that 4381 as a gateway," says G. Nicols Simonds, director of MIS for Chrysler. "It allows the Technical Computer Center and the IBM computers to share files."

The fifth computer center, the Outer Drive Manufacturing Development Center in Detroit, uses a Digital Equipment Corp. VAX-11/780 for additional design functions. In the Chrysler factories themselves, more satellite computers, most of them IBM 4300s or Series/1 minicomputers, control operations.

The four major computing centers, scattered throughout the greater

Detroit area, are linked by T1 carrier lines. In this way, the sites can send backup files to each other, protecting Chrysler against irreparable data loss should a disaster occur at one of the sites.

At the Technical Computer and Instrumentation Center, about 2,500 Chrysler designers and engineers can access what amounts to a single, virtual computer system with a processing capability — not including the

Cyber 205 supercomputer 98 millio of million instructions s per (MIPS). second The center's communications network reaches out to remote Chrysler locations Syra cuse, N.Y., and Huntsville, Ala., and to factories elsewhere in the U.S and in Canada and Mexico.

Brauburger and other Chrysler managers do not judge the value of their computer systems by MIPS alone. Instead, they look at the amount of work they can get done—and the productivity gains they deliver.

Because of the Technical Computer and Instrumentation Center's power, the company has cut its time to market dramatically. Designers can now dream up cars, outfit them with various components, crash-test them and then discard the design if

necessary and start again. This can all be done on-screen, without ever having to build a clay model of the automobile. Another practical effect: Chrysler's managers get to see prototype cars a lot sooner than they did in the past.

"Let's say a vice-president of engineering wants to look at the designs," Brauburger explains. "He wants to see information from various types of computers, and he

77

Building a powerful

computer resource was Chrysler's way

of saying it intended

to stay among the top

three, alongside Ford and GM. wants to see it right away. We're working on interfaces be tween the systems so that executives can get that kind of information from the terminal right on their desks."

But the beefed-up computer resources do much more.

Brauburger and other Chrysler computer executives believe. The supercomputers increase productivity of Chrysler's designers and engineers by a throughput gain of 25% to 30% every three years. With the help of the supercomputers, drafting time has been reduced by a factor of 70-to-1. For some engineering tests, for example, a four-month process of building and testing a physical model is reduced to a one-day computer simulation.

The productivity gains — typically a ratio of 3-to-1 or better — have

AT A GLANCE



Net Sales -1985: \$21.26 billion 1986: \$5.78 billion (first quarter), \$5.7 billion (second quarter)

Net Earnings -1985: \$1.64 billion 1986: \$356.9 billion (first quarter), \$488.2 million (second quarter)

Market Share - 1985: 11.4%, cars; 12.8%, trucks 1986: 11.5%, cars; 12%, trucks (through second quarter)

Capital Expenditures -1981-1985: \$4.7 billion 1985-1990: \$12.5 billion (projected)

been climbing during the past two years. The 1984 addition of the Cyber 205 alone more than tripled Chrysler's computer-aided design (CAD) resources.

### A nonrestrictive choice

The Cyber 205's simulation capabilities, its 64-bit architecture and its ability to do high-speed vector calculations played a part in Chrysler's choice of CDC computers to provide a design and engineering solution. The automotive company chose CDC at a time when IBM and IBM-compatible suppliers like National Advanced Systems Corp. and Amdahl Corp. did not provide vector processors in their standard mainframe line.

Choosing CDC did not lock Chrysler out of the IBM world. Corporate
MIS at Chrysler uses IBM main-

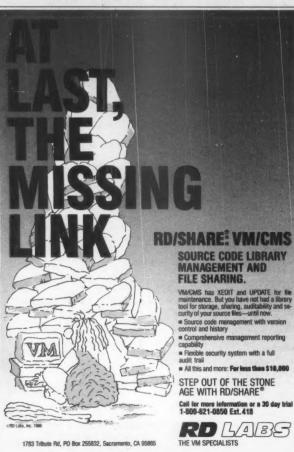
frames and an SNA communications network. The combination of the CDC Loos ly Coupled Network (LCN) product with an IBM 4381 on-site at the Technical Computer and Instrumentation Center allows engineer-ing to send technical reports to the corporate IBM computer room down the street.

It is Brauburger's conten-

tion that the configuration within the Technical Computer and Instrumentation Center — a series of CDC mainframes linked by fiber-optic cable and twisted-pair wire — gives Chrysler maximum flexibility.

. It allows Chrysler engineers to gain access to machines by IBM, Digital Equipment Corp. and other vendors, whether the computers are remote or not. Console operators control access to each of the computers by assigning logon identification codes.

Usually, a department will restrict its work to two or three of the mainframes, but individual users may skip around the mainframes if they like. Users must specifically request a Cyber if it is not designated for their group. For example, the designated computer may be called N1 and the desired computer N12. Users



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FEATURES	TVI 955	WY-50	WY-50+	
Screen Color	Green or Amber	Green Only	Amber Only	
Optional Graphics model	Yes	No	No	
Dynamically allocated non- volatile function key memory	512	128	140	
Maximum non- volatile bytes per function key	256	4	64	
High contrast super dark Mat- sushita screen	Yes	No	No	
List price	s629	\$599	\$699	

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wishing to switch to N12 simply type in the code name after logging on to their "home" computer. Sometimes the computer requested is out of state, but the user need not know this — the routing is done automatically and transparently.

cally and transparently.

"We've been taking advantage of different technologies that are running on different types of processors," explains Walter Weglarz, manager of computer operations and systems at the Technical Computer and Instrumentation Center. "But from a processing standpoint, it's functioning as a single system."

That setup also allows some of Chrysler's suppliers to gain access to the computing resource, thereby submitting designs and bills to the Chrysler network directly.

Chrysler network directly.
To integrate a single, virtual system of multiple CDC computers, key

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'Some people thought the massive installation was a sandbox for us to play with. But it wasn't. We designed cars with it.'

- Robert Brauburge Chrysler Corp

ingredients were added to the wealth of raw processing power. "The design is interactive, the response time is critical and the blocks of data we handle are very large," Brauburger says. "So we need large computer capacity, but we also need very intelligent terminals and high-capacity telecommunications."

To accomplish the latter, homegrown software projects have knit the stand-alone mainframes into a virtual network, allowing users to jump from an application on one mainframe to a second application on another. These software interfaces were built on top of CDC's LCN, a communications product similar to Network Systems Corp.'s Hyperchannel link.

The LCN is hardware independent, allowing LCN protocols to transport data from one host to another dissimilar host for further pro-

cessing. Although potentially capable of running at up to 50M bit/sec., the network generally operates at a sustained throughput of 5M to 6M bit/sec.

A standard file format devised by Chrysler programmers standardizes the presentation of data so that it appears the same on-screen for each piece of computer hardware.

piece of computer hardware.

In addition, the company's engineers use a variety of intelligent terminals from Computervision Corp.,
Tektronix, Inc. and Evans & Sutherland, Inc. to relay data and ideas between dissimilar machines. Designs developed on these workstations can easily be sent to remote sites, such as Chrysler's New Process Gear plant in Syracuse, which also hosts a Cyber 180 mainframe, or to the Huntsville Electronics Division, which makes custom circuit boards for Chrysler cars using a DEC VAX-11/780 minicomputer and a Cyber 180 mainframe.

Chrysler programmers are now fine-tuning the system, adding new interfaces so that data originating in one of the Cyber mainframes can be manipulated in Sun Microsystems, Inc. or Apollo Computer, Inc. Unixbased workstations.

Finally, the whole system — all of the machines in Highland Park had to be able to feed data into a single data base. That capability is essential to the eventual success of Chrysler's move toward computerintegrated manufacturing.

Beginning in 1981, all files and electronic blueprints were stored in a single hierarchical data base of Chrysler's own design. Now, work is under way to convert that data base into an object-oriented relational data base, but the project will not be completed for another year.

Chrysler is building on CDC's engineering data library data base management system but is adding some features that it and other automotive manufacturers require.

# Finding targets for technology

The continuing challenge for the Technical Computer and Instrumentation Center managers is to identify those areas of the design and engineering function that will most benefit from inclusion in the center's network. And, while Chrysler itself has fully automated some of its factories, more progress has been made on the side of computer-aided design and engineering than on computer-aided manufacturing (CAM).

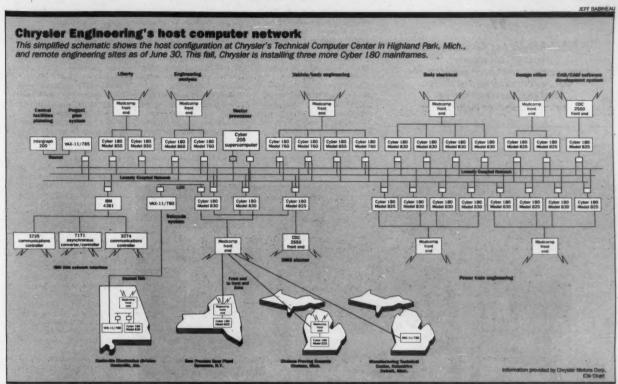
At Chrysler, as at the other major U.S. car companies, new styling is critical to sales of the next year's car models. Change for the sake of change means elements of the car will have to be redesigned from year to year. As Brauburger says, "That's where all this CAD comes in."

This fall, Chrysler is rolling out seven new models, each bearing the mark of CAD/CAM technology. Among the items typically considered for styling changes are wheel covers, mirrors, overall lines and special features. By using CAD techniques, engineers can speed this process, making changes more quickly and accurately than is possible through manual techniques, like the building of clay models.

In true CIM, each step of the man-

In true CIM, each step of the manufacturing process acts as the basis for the next step, so that a single set of CAD/CAM drawings can be passed electronically to the next step via a design data base. Some say that this





Chrysler's Loosely Coupled Network is hardware independent so dissimilar CPUs can share processing. The result is a 98-MIPS virtual machine linked by fiber optic and twisted-pair cables. The Highland Park site sends billing and reporting information to corporate MIS — an SNA environment — via an IBM 4381.

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While Chrysler has fully automated some of its factories, more progress has been made on the side of computer-aided design and engineering than on computer-aided manufacturing.

way, designers avoid throwing a drawing "over the wall" to engineering or manufacturing.

ufacturing.

In CIM, a designer starts the ball rolling by drawing his concept of the car body. The engineer, the next one in line, then creates a group of specifications to match the drawing, thereby creating an electronic geometry that will stay with the car body the rest of the way to the factory floor.

tory floor.
This geometry can then be

used in software programs to generate electronic blueprints, three-dimensional drawings, structural analyses and, finally, the numerical-control instructions that will cut metal to be used in building the car.

So far, only selected operations have been made into end-to-end CIM processes. Among them are a fabric-cutting operation for car upholstery and a wood-cutting operation for the manufacture of wooden panels on proto-

type car models.

The next step in Chrysler's CIM strategy will be to use the data from the solid-modeling process to control manufacturing machines on the factory floor. "We are looking at a variety of systems to achieve that level of integration," says Gregory Avesian, the center's test and development engineer. "They would need to use information from our solid-modeling techniques to create tool paths."

Chrysler will achieve this level of integration, according to Avesian, but it will take some time — perhaps two years or more. So far, only a handful of companies have achieved end-to-end CIM, and most are not as complicated an enterprise as Chrysler.

hrysler.
Computerized design

For now, the benefits of computerizing the design process lie mostly in the CAD and computer-aided engineering area. For example, the Cyber 205 allows a designer to summon an electronic image of a solid-look-

ing wheel.

But the supercomputer, which takes 10 minutes, running at 50 million floating-point operations per second (MFLOPS) to 200 MFLOPS to create the image, cannot make the wheel rotate onscreen without reprocessing it—another 10-minute delay for every angle displayed.

played.
"We want to be able to
move these shapes around in
real time," Avesian notes,
"but the technology isn't
there yet."

However, the supercomputer will do something else: It will calculate the wheel's mass and density and figure out how much inertia it will add to a moving ear.

add to a moving car.

The power of the collection of CDC mainframes already gives the computer center's users more control than they had five years and

than they had five years ago.
"The system allows twothirds of the car to be designed by one-third of the
people," says Glen Bibbins,
the center's manager of engineering systems development. "Every day, 800 people use the system to
generate realistic-looking
models of a car that doesn't
exist. You can show these
computer prototypes to top
management, and they can
pick which cars they like."

The emerging factoryautomation standards, Manufacturing Automation Protocol (MAP) and Technical Office Protocol (TOP), have not yet come into play in Chrysler's factories. Neither has ANSI's Initial Graphics Exchange Standard (IGES), which specifies the exchange of graphics design data bases between different CAD/CAM systems.

The reason, Brauburger says, is that Chrysler could



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not afford to wait until these standards became finalized. For example, IGES Version 2.0, completed in 1983, works only with two-dimensional designs; Chrysler software already works in three dimensions.

So in some cases, Chrysler software engineers have had to reinvent the wheel, even if that wheel has to be somewhat modified later on.

After building up the computer resources, the center's managers decided to apply it to those areas that would experience the greatest productivity gains. Drafting is a good example. Hand-drafting designs

takes about 70 times as long as generat-

ing the designs on-screen, Avesian and others estimate.

In addition, the ability to use the same electronic geometry throughout the design and engineering process has sharply curtailed errors. In the manual process, drafters often introduce errors when transferring their

drawings from one blueprint to another.

tually, the hope is that the identical geometries can be used to calculate numerical-control instructions for directing the drilling, welding and robotic machines in the

robotic plants.

One of the most enthusiastic responses to new technology comes from Cyber 205 users working with Synthavision, a design software package developed by Mathematical Applications Group, Inc. in Elmsford, N.Y., and leased through one of CDC's third-party suppliers.

third-party suppliers.
Synthavision's solid-modeling module allows the
Cyber 205 to generate electronic renderings of the surface of a car or component based on its internal geome

try.
Synthavision gives designers their first glimpse of the finished product, down to the color of the paint and upholstery. Designers have hundreds of colors — and any shade variation of those colors — from which to choose, although they can use only four at any one time.

The colors are chosen from a color palette that is displayed on-screen. The designers also use the Cyber 205 to visualize parts, such as gears or wheel covers, rotating these images as they

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'The system allows two-thirds of the car to be designed by onethird of the people.'

- Glen Bibbins Chrysler Motors

would move during the vehicle's operation to spot any possible interference or rubbing

The addition of new imaging techniques will allow the Cyber 205 to put high-quality, convincingly realistic images on screen.

These images, Avesian says, "will be viewed by upper level management prior to our building full-size theme models."

Right now, software engineers are refining their imaging techniques even further for executive presentations. Someday they may be able to include reflections from shiny surfaces on top of and underneath the car to produce a picture close in quality to a photographic image.

## Doing more with less

After the designers are finished, the engineering process begins. Chrysler has developed in-house several key pieces of CAD/CAM software for engineering

ware for engineering.
Among them are Quickcon and Concept for three-dimensional wire-frame modeling and GCSNast for pre- and postprocessing of Nastran applications.

Nastran, an industry-standard package developed by the National Aeronautics and Space Administration, enables the Cyber 205 to conduct extensive structure analysis through finite-element analysis.

Chrysler's GCSNast package prepares both the input and output files that are used by the Nastran soft-

Avesian estimates that Chrysler engineers now spend 1,500 man-hours each week generating computerized surface images based on electronic blueprints. The 3-1 ratio of productivity gains



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for this type of work was strictly planned

That kind of qualitative change in Chrysler's car development is what Brauburger and his staff were after when they built up their computing resources in the early 1980s.

But even as the number of computers was growing, the number of people required to run the computer operation was shrinking. Brauburger

ys, "We're doing more with less." In fact, just five console operators per 24-hour period are needed to tend the 27 Cyber 180 mainframes. Since they do not have to contend with batch jobs, these operators spend their time keeping the systems up and running to support interactive transactions.

Chrysler managers felt that they had surely broken new ground when they created the massive orchestration of computer hardware and software that is the Technical Computer and Instrumentation Center. The company, quite simply, was facing questions that had not been answered yet in the automobile indus-

The engineers say they must use their past experience with computer systems to guide them. "There are no rules to this," Brauburger says. "We use our intuition and knowledge, and one of the secrets to our success has been guessing right."

### The pursuit of CIM

Chairman Iacocca repeatedly stresses the company's commitment to state-of-the-art technology in keeping the company competitive. As early as 1962, Chrysler began to use the first CAD data bases

From the beginning of the Technical Computer and Instrumentation Center, which is nearly 20 years old, Chrysler has chosen to view data as

a valuable commodity. Still, managers are intently pursuing the application of CIM tech niques to the manufacture of Chrysler's future car lines. This fall, three more Cyber 180 mainframes are being installed at the center.

# **Project Liberty**

Two of these computers will be devoted to Project Liberty, a Chrys-ler plan to develop CIM computer programs that will build future car lines using a single data base of engineering elements from design to finished product.

If all goes as planned for the next few years, Chrysler will move part of its technical computer complex to Auburn Hills, Mich., about 30 miles north of Highland Park. There, in the 500-acre Liberty Center complex, Chrysler engineers and designers will devise CAD/CAM solutions and CIM programs for future car lines

Project Liberty will be the psycho-logical equivalent of GM's Saturn project, Chrysler engineers say. It will provide a think tank in which Chrysler engineers can maintain a position on the leading edge of technology while forging better links be tween design systems and manufacturing systems

Right now, this leap forward is being held back by some very down-to-earth political considerations, such as questions raised by local zoning authorities.

But when it is built, the Liberty Center will be the point from which Chrysler launches its plans for the 21st century

Chrysler has already made great

77

'We don't move in lockstep like a phalanx, but we don't have islands of automation. We have levels of enthusiasm.

to become the first factory to pro-

duce the now-popular Plymouth Voyager and Dodge Caravan mini-

There, dozens of robots do the

spot welding, sending sparks flying

without human intervention. But the robots are controlled by programs

bert Brauburger Chrysler Motors

strides in automating its plants. In 1983, at a cost of \$400 million, it within the factory, not by programs automatically generated from the revamped the Windsor, Ont., plant that produced its New Yorker sedans original electronic renderings of the

### More work to do

By its own accounts, Chrysler is the most automated U.S. car company, with highly automated factories like the "Dodge City" plant in Warren, Mich., that makes Dodge trucks and the Sterling Heights, Mich., plant that makes Chrysler LeBarons, Dodge Lancers, Dodge Shadows and Plymouth Sundances. And yet, Chrysler has more work to do to achieve total CIM

The goal of corporate computer planners like Brauburger is to be able to spread CIM throughout the company — letting the original designs flow through the entire system. "The car is a complex beast," he says. "And not all portions of the company are embracing the technology at the same time.'

But Brauburger is quick to say that Chrysler does not have the socalled islands of automation that typically plague companies developing computer-integrated manufactur-ing systems. "We don't move in lockstep like a phalanx," he says, "but we don't have islands of automation. We have levels of enthusiasm."

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TAKING CHARGE

# Angst of the **BUNCH** user

UNCH is an amusing acronym for the companies that were once IBM's chief competitors in the mainframe computer business Burroughs Corp., Univac Corp. (now Sperry Corp.), NCR Corp., Control Data Corp. and Honeywell, Inc.

At one time, the group numbered "the seven dwarfs" - and included General Electric Co. and RCA Corp., which have left the commercial computer business. Now the count is down to four, with Burroughs' acquisition of Sperry, and may drop to three with an exit by Honeywell.

Corporate management of companies that use computers made by the BUNCH is certainly aware that IBM has become the dominant supplier and that its rivals have had financial difficulties in recent years. These firms are concerned that their supplier might leave the business or fail to supply the technology they need to be competitive.

In most cases, companies with BUNCH computers selected their ven-dors prior to the mid-1970s for what were then very good reasons. Even to-day, each of the BUNCH has special strengths in certain markets: Burroughs in banking, Sperry in government, NCR in retailing, CDC in science and engineering and Honeywell in manufacturing.

But management in BUNCH user companies now has three primary questions, which are:

What is the likelihood that my See ANGST page 94

Klein is vice-president of John Diebold & Associates, a division of The Diebold Group, Inc. of New York.

# Corporations scan videotex

**Business demand doubles** despite slow home market

By David A. Ludium

Videotex, nearly moribund as a consumer service compared with the glowing forecasts of recent years, is catching on as a corporate communications tool.

At \$88 million, the market for consumer videotex systems in North America this year should be twice the size of the corporate market, according to Link Resources, Inc. of New York. The firm projects, however, that by 1990 the corporate market will far outstrip the home market, climbing to \$396 million, while the home market reaches only \$169 million.

The market for corporate videotex systems in North Ameri-

ca has grown from \$18 million in 1984 to an estimated \$44 million this year, according to Link Resources. It expects to see 509 videotex systems installed in North American corporations by the end of 1986, more

than double the number from a year earlier, and more than 5,500 systems in place by 1990.

'I think the corporate market is where the action is in videotex," says David Baker, manager of office automation systems for United Telephone Co. of Florida. "Our business environment is becoming increasingly complex. We have more information

to manage than ever before, the timeliness of that information is becoming increasingly impor-tant and videotex is a solution."

Corporations are using videotex — a two-way, interactive text-and-graphics communications system accessed through personal computers or terminals — to move information to audiences that include suppliers, distributors and customers as well as their own executives and other employees.

A look at three corporate videotex users depicts the variety of functions the systems perform and highlights some of the management considerations

involved.

United Telephone of Florida is aiming its Infonet videotex systems at providing top executives with fresh, easily accessible information and reducing costs of widely distributed paper reports, Baker says. The company chose Digital Equipment Corp. VTX videotex software when it found the software would operate on the VAX running its All-In-1 office automation system, Baker says. The two integrate "very nicely," he notes.

Information can be moved easily to the DEC videotex system from both decision support programs on All-In-1 and, using a Systems Network Architecture gateway, from an IBM 3090 used for data process

ing, according to Baker.
While videotex lowers costs by reducing use of paper, its real benefit lies in making fresh information easily available to top decision makers. Baker says. "Nobody has to sit there and play with spreadsheets,"

Baker singled out the videotex system's ability to convert, with no human intervention, raw data entered by clerks in remote offices to reports for vice-presidents

See CORPORATIONS page 90



# Corporate videotex ed growth in unit sales of the videotex systems in mber of Systems

# INSIDE

Survey says DP managers' salaries on rise/90

Calendar: Selected conferences. exhibitions, seminars/92

# INSTANT ANALYSIS

"It's a lot cheaper to use a lot of little computers than one big one, just as it's cheaper to use 10 horses than to cultivate one very large one."

hael Dertouzo professor of puter science and electrical engineering, MIT

# Technology Slightly Ahead of its Time.

Successful corporations grab large market share because they use existing technologies in effectively novel ways. They make life easier and better for their customers. They understand how DP technologies can be used to increase productivity and bolster returns on investment.

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**Bulck's Newell** 

# **Corporations** scan videotex

From page 89

on a key statistic known as the exchange maintenance index.

He concedes that such value is hard to quantify but says he has found traditional cost-justification methods "wholly inadequate for office automation systems

Using a conventional data base system to generate the same information would involve a longer response time and require 10 times as much

computing power, he adds.

At General Motors Corp.'s Buick Motor Division, videotex provides data on products to dealers, who can use it to answer customer questions. and to potential customers directly through public access terminals, of which there are now four.

Buick's Electronic Product Infor-

mation Center provides information such as locations of cars with certain features, the costs of a car given specific options or financing programs and the status of orders.

Buick developed the system jointly with IBM and Electronic Data Systems Corp. Dealers use IBM Personal Computer ATs that contain a local data base and a modem for retrieving updates, which

are distributed two to three times a week via a VAX 11/780. At \$9,900, including a printer and cabinet, Buick has sold systems to 418 of its roughly 3,000 dealers since May 1985.

The division expects to have 600

systems sold by Sept. 1987, says Nan-cy Newell, senior coordinator

nator for Marketing Through Technology. "It makes salesman's presen-tation very credible. It provides a competitive edge for showroom sell-ing," Newell says. Buick's system also "gets rid of all that hard copy," she notes.

American Airlines has launched Eaasy Sabre, a videotex system that extends the reach of its high-

ly profitable Sabre system, which is used by travel agents to make reservations and retrieve information on flights, hotels, rental cars and other travel services

Eaasy Sabre lets personal computer users dial up information and book flights and other services through several public networks. They include Dialcom, a business service owned by British Telecommunica-tions PLC; General Electric Information Services Co.'s business network and Genie consumer service; and Quantum Computer Corp.'s Quantum Link service for Commodore users. American is discussing use of other networks, said Helen Bradley, Eassy Sabre project manager.

Eaasy Sabre provides access to four Sabre IBM mainframes frontended by a group of VAXs that translate Sabre's protocol into ASCII characters to be sent over the CCITT X.25 packet-switched networks, according to Bradley."VAX had a product to interface with X.25 and IBM didn't," she says, explaining the choice of equipment.

Bradley would not disclose how profitable Eassy Sabre is but says the airline is "very encouraged." She declined comment on its costs except to say they were incremental and largely for translating the Sabre protocol into "plain English."

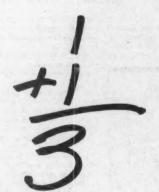
American launched Eassy Sabre after extensive study, Bradley says. "We had done a great deal of research and were confident that the time was right. We analyzed our target market and saw there were

ough people out there."

DEC is the leading vendor of inhouse videotex systems, with installations numbering about 300 and "growing appreciably," according to Joshua Harris, senior analyst with Link Resources' videotex planning

Most of DEC's systems are at Fortune 500 companies and are sold through sales, marketing or other departments rather than MIS shops, Harris says. DEC generates a large share of its videotex revenue through consulting, he adds.

DEC's success stems in part from videotex's fit with its overall product line, both in terms of function and connectivity, Harris says. "DEC is the biggest success story in this par-ticular area," he says.



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NANEX Business Information Systems (2)

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than \$3 million.

The AFCOM survey generated responses from 375 companies, universities and other organizations, cording to Len Eckhaus, AFCOM's president, who said he is surprised at the movement of salaries for DP operations managers above \$50,000. Most of the companies surveyed are Fortune 1,000 firms, he added.

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CALENDAR

# OCT. 26-NOV. 1

Digital Document Automation: The Emerging User. Reston, Va., Oct. 26-28 — Contact: Institute for Graphic Communication, 375 Commonwealth Ave.. Boston, Mass. 02115.

American Trucking Association Fall Workshop and Systems Demonstrations. New Orleans, Oct. 26-29—Contact: ATA Management Systems Department, 2200 Mill Road, Alexandria, Va. 22314.

International Data Corp.'s MIS Executive Conference. Palm Springs, Calif., Oct. 26-29 — Contact: IDC, 5 Speen St., Framingham, Mass. 01701.

Fifth World Congress on Medical Informatics. Washington, D.C., Oct. 26-30 — Contact: George Washington University Medical Center, Office of Continuing Medical Education, 2300 K St. N.W., Washington, D.C. 20037.

The State of the Art in Computer Capacity Management. Tarrytown, N.Y., Oct. 27 — Contact: International Systems Services Corp., 41st Floor, Two Grand Central Tower, 140 E. 45th St., New York, N.Y. 10164.

Annual Teleconferencing Users Conference. Anaheim, Calif., Oct. 27-29 — Contact: Applied Business Telecommunications, Box 5106, San Ramon, Calif. 94583.

Data Processing Management Association Annual Computer Conference and Business Exposition. Atlanta, Oct. 27-29 — Contact: Conference and Meetings Manager, DPMA International, 505 Busse Highway, Park Ridge, Ill. 60068.

Hammer Forum 86. Cambridge, Mass., Oct. 27-29 — Contact: Hammer and Co., Five Cambridge Center, Cambridge, Mass. 02142.

Optimizing Software Productivity and Quality. Arlington, Va., Oct. 27-29 —
Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402
National Database and

National Database and 4th Generation Language Symposium. Dallas, Oct. 27-30 — Contact: Software Institute of America, Inc., 8

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Windsor St., Andover, Mass. 01810.

Satech '86. Boston, Oct. 27-31 — Contact: No. 34, 2472 Eastman Ave., Ventura, Calif. 93003.

Token-Ring Vendor Forum. San Jose, Calif., Oct. 29
— Contact: Network Strategies Group, 1435 Koll Circle, San Jose, Calif. 95112.

Distribution Computer Expo '86 East. Parsippany, N.J., Oct. 29-30 — Contact: C. S. Report, Inc., P.O. Box 453, Exton, Pa. 19341. Applications of Artificial Intelligence and Expert Systems. Arlington, Va., Oct. 29-31 — Contact: Learning Technology Institute, 50 Culpeper St., Warrenton, Va.

Association of Public Data Users 11th Annual Conference. Washington, D.C., Oct. 29-31 — Contact: Susan Anderson, APDU, 87 Prospect Ave., Princeton, N.J. 08544.

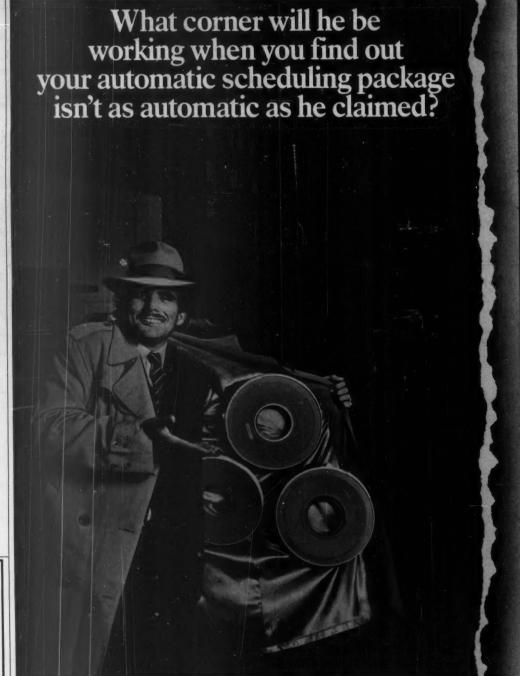
2nd Annual Pansophic Users Learning & Sharing Exchange (PULSE). King of Prussia, Pa., Oct. 30 — Contact: Susan Masterson, Regional Administrator, Pansophic Systems, Inc., Suite 103, 485 Devon Park Drive, Wayne, Pa. 19087.

Telecommunications and the Computer Connection. White Plains, N.Y., Oct. 30-31 — Contact: Pace University, Bedford Road, Pleasantville, N.Y. 10570.

Computer Dealers and Lessors Association Annual Meeting. Colorado Springs, Colo., Oct. 30 to Nov. 1 — Contact: CDLA, 1212 Potomac St. N.W., Washington, D.C. 20007.

The End-User Revolution.
San Francisco, Oct. 31—
Contact: Association for Systems Management, 24587
Bagley Road, Cleveland, Ohio
44138

UCSD Pascal Users Society Biannual Meeting.
Greenwich, Conn., Nov. 1-3
— Contact: Software Systems, Inc., 1410 39th St.,
Brooklyn, N.Y. 11218.



# **NOVEMBER 2-8**

ADAPSO 65th Manage ment Conference. Phoenix, Nov. 2-5 — Contact: ADAPSO Education Dept., Suite 300, 1300 N. 17th St., Arlington, Va. 22209.

1986 NAWGA Computer Conference and Expo. At-lanta, Nov. 2-5 — Contact: National-American sale Grocers' Association, 201 Park Washington Court,

Falls Church, Va. 22046.
Fall Joint Computer Conference '86. Dallas, Nov. 2-6
— Contact: Stanley Winkler,
FJCC '86, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Managing the Information Resource. Los Angeles, Nov. 2-7 — Contact: Office of Executive Education, Graduate School of Management, University of California, Los Angeles, Calif. 90024.

Disoss Implementation. Washington, D.C., Nov. 3-4

Contact: The Georgetown Group, Inc., Moore-McCand-lish House, 3950 Chain Bridge Road, Fairfax City, Va. 22030. Also being held Nov. 5-6 in Washington, D.C. and Dec. 8-9 and 10-11 in New York.

Automated Manufactur-ing Exhibition and Confer-ence. Greenville, S.C., Nov. 3-6 — Contact: Allen F. Barney, AM86, P.O. Box 5616, Greenville, S.C. 29606.

Electronic Imaging '86. Boston, Nov. 3-6 — Contact:

MG Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

Long Range Information Systems Planning. Washington, D.C., Nov. 3-6 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

Advancing Standards Technology for Distributed Information and Telecom munications Systems. Boston, Nov. 3-7 — Contact: Omnicom, Inc., Suite 304, 501 Church St. N.E., Vienna, Va. 22180. Also being held Dec. 15-19 in Denver.

Corporate Publishing. Electronic Saddlebrook. Nov. 4 N.J., Contact: Texet Corporation, 37 Broadway, Arlington, Mass., 02174. Also being held Nov. 5 in Atlanta, Nov. 6 in Chicago and Nov. 7 in Seattle.

North American Telecom munications Association Convention & Exhibition Showcase. St. Louis, Nov. 5-7 Contact: NATA, Suite 550, 2000 M St. N.W., Washington, D.C. 20036.

Scientific Computing & utomation Conference Automation and Exposition. Atlantic City, Nov. 5-7 — Contact: Anthony Scalisi, Expocon Management Associates, Inc., 3695 Post Road, Southport, Conn. 06490.

Second Annual Conference on Optical Storage for Small Systems. Los Angeles, Nov. 5-7 — Contact: Technology Opportunity Conference, 256 Laguna Honda Blvd., San Francisco, Calif. 94116.

Second Annual Software Management Strategies Conference. Toronto, Nov. 6-- Contact: Gartner Group. Inc., 72 Cummings Point Stamford, Conn 06902.

**NOVEMBER 9-15** 

Information Industry As-

ociation 18th Annual Convention & Exhibition. New York, Nov. 9-12 — Contact: IIA, Suite 800, 555 New Jersey Ave. N.W., Washington, D.C. 20001. Association for the Development of Computer-Based Instructional Sys-tems Annual Conference.

Crystal City, Va., Nov. 10-13

— Contact: ADCIS, Room
409, Miller Hall, Western Washington University, Bel-

Comdex/Fall '86. Las Vegas, Nov. 10-14 - Contact:

The Interface Group, 300

First Ave., Needham, Mass.

lingham, Wash. 98225.

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Most importantly, UCC-7 is easy to

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ucc-11 prevents the inevi-table job reruns from disrupting processing or consuming valuable ources. It automates

SCHEDULING started with a si forms step resta JCL changes arted with a single command. It per rms step restarts and reruns without LL changes, and automates associate its set and OS catalog maintenance, prevents "NOT CATLGD 2's" and ductivity of your resources.

UCC-11 also collects all pertinent job status data automatically, making it available as needed. Its flexible reporting system helps you to isolate the causes of reruns, and assess resource productivity and spoilage.

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# Angst of the **BUNCH** user

mainframe vendor will exit the marketplace, and what happens to me if

• "Am I missing out on something by staying with my current vendor? "Can I afford to convert?

The well-publicized financial difficulties of CDC and the examples of GE and RCA show that it is a real possibility for a mainframe vendor to leave the business.

In the past, the company's customer base was bought and supported by another vendor, which provided a migration path to its own equipment. Honeywell bought GE's

customer base; Sperry bought RCA's. The experience of the customers in these situations varied, however. GE customers had a relatively

smooth time of it, because the GE architecture became the mainstay of Honeywell's large-systems line.

Whether a company is missing out on something by remaining outside the IBM environment depends on several factors, including availability of packaged software, labor supply, vendor support, unit costs and

how the mainframe is used. Some industries, such as public utilities, are highly regulated. Others, such as airlines, require a high degree of cooperation among companies. Both have tended to develop fairly standardized business pratices, which make them good candi-

dates for packaged application software. Naturally, there are far more choices available in the IBM environ-

In other industries, packages are used primarily in administrative areas, such as accounting. Packages are generally available for these applications in the BUNCH environment: they are sometimes versions of an IBM package.

MIS personnel recognize that the market for workers experienced in the IBM environment is an order of magnitude larger than that for any incompatible mainframe environ-

But because economic conditions are still favorable and data proces ing is still an attractive career, those BUNCH users that can meet their additional staffing needs, primarily with trainees, generally are not experiencing labor shortages. Also, those BUNCH users that are the employer of choice in their area seem to have little difficulty in attracting

and retaining MIS personnel.

The importance of vendor support and the capabilities of the vendor to provide support and expertise frequently vary from industry to industry and location to location. Thus, either an IBM or a non-IBM mainframe vendor may have an advan-

tage in any specific instance.
Information-intensive businesses such as financial services may find that computer costs are a significant factor in their competitiveness. Such companies will generally do better in the IBM environment, where unit costs — as measured, for example, by cost per millions of instructions per second — are lower and falling faster than in the BUNCH environment. In other businesses, the unit costs of computing may be far less important.

How is the mainframe used? Is it for a broad variety of applications or a single one? Is it in a variety of - batch, interactive, realtime, on-line — or a single one? In dedicated applications, non-IBM mainframes and software may provide a better solution.

Just as packaged software devel-opers and MIS employees recognize that the IBM-compatible market is much larger than any other, so do other suppliers of products and ser-

IBM's research and development and low manufacturing cost have put the same kind of competitive pressure that they put on other mainframe vendors on manufacturers of plug-compatible peripherals, including CDC, Memorex Corp. and Storage Technology Corp., and on makers of terminals. But there are still many more such vendors in the IBM environment than in any other.

Similarly, there are more supply manufacturers, systems develop-ment firms, personnel contracting firms, recruiters, publishers, educa tors and trainers catering to the IBMcompatible market than to any other. And as usual, where there is more competition, there tend to be lower

How important these choices and price differentials are to any particular user will obviously vary from

company to company.

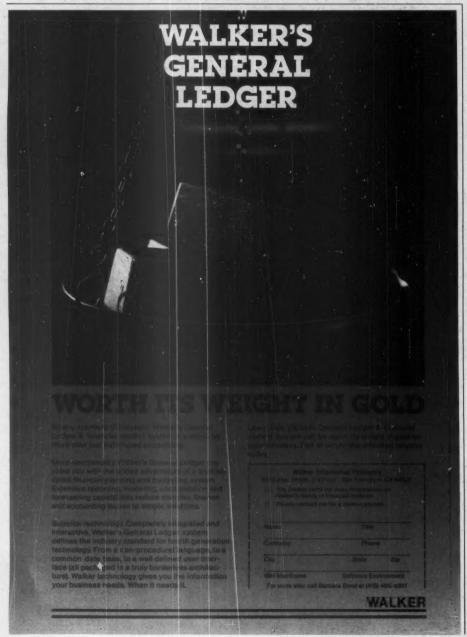
Even if a firm's concerns indicate a need to move into an IBM environment, the question eventually boils down to the issue of conversion

There are companies in which current information systems do not support today's business needs. These firms must replace their current systems in order to remain competitive. For them, it probably makes sense to build the new systems in an IBM environment.

There are also companies in which current information systems support today's business needs fairly well, but in which there is a critical need to develop one, or a few, major new application systems.

These companies are usually better off avoiding a conversion and concentrating on the new applica-

In summary, both the decision to remain with a BUNCH vendor and the decision to convert to an IBM environment are valid choices for different companies.



# **NEW PRODUCTS**

# Multitasking tool debuts for LANs

Lan Systems, Inc. of New York has introduced Release 3.0 of its local-area network (LAN) APX Core Executive multitasking software for LANs.

According to the vendor, APX Core can support up to eight tasks, subject to the memory limitations of the computer and the memory requirements of the individual programs.

Features of APX Core include complete ess to Microsoft Corp. MS-DOS and IBM PC-DOS commands, full-screen or window view for each task, central access to multitasking from any network station and the ability to move data between tasks.

APX Core is said to run network. MS-APX Core is said to run network, mo-DOS or PC-DOS and application software simultaneously and to support network standards for Novell, Inc. and 3Com Corp. networks and IBM's Token-Ring net. It requires 43K bytes of memory plus 5.5K bytes per task.

LAN/APX Core is priced at \$750 per

eight-node license.

Lan Systems has also introduced the LAN Librarian, a network file cataloging system for LANs. It is said to be a document annotation system that catalogs all work done on a network installation.

Features include automatically main-tained catalog cards for each file detailing original author, current user, revision his tory, subject and key words; a data base of network file activity; the ability to operate across multiple file servers; access to archive files by author, subject or key words; and multiuser backup and restore.

The LAN Shell, the vendor's menu de velopment system for LANs, can be configured to invoke the Librarian automatically, ensuring that users always enter the information needed for file tracking.

The Librarian is available in an Administrative Pack for \$495, allowing use on five network nodes. An additional 10-node pack costs \$495, and single-user add-ons cost \$69.95.

The LAN Shell costs \$750 per eightnode license. The single-user price is \$195.

# NEC releases PC-8500 portable PC, insurance and real estate tools

NEC Home Electronics, Inc. of Wood Dale, Ill., has introduced the PC-8500 portable personal computer.

The PC-8500 features an 80-col. by 25line, high-contrast LCD screen. It has 64K bytes of internal random-access memor (RAM) and measures 8½ by 12 by 2¼ in. It offers four built-in software programs

— Wordstar-to-go, Calc-to-Go, Personal
Filer and Telecom. Built-in phone jacks
provide access to modular phone lines through the PC-8500's standard 300 bit/ sec. modem or enable the unit to be used as an autodialer.

The NEC PC-8500 also provides a parallel printer port and an RS-232C I/O port. A system slot makes it possible to add a 32Kbyte RAM cartridge; a 128K byte RAM cartridge with access available for a 128K byte read-only memory cartridge; a CRT/ Disk adapter for a monochrome or color

monitor; or a 1,200 bit/sec. modem.

The NEC PC-8500 personal computer is priced at \$999.

NEC also announced software for the PC-8500 designed specifically for the insurance and real estate industries. Insur-ance Expert I includes comparative life, cash expert, a client tracking system and



The PC-8500 offers 64K bytes of RAM.

an insurance-oriented calculator. Insurance Expert II covers estate planning and trust planning as well as a Social Security

Real Estate Expert provides on-site re-ports and evaluations. It also includes a client tracking system and a specialized calculator

The software programs cost \$299 each. according to the vendor.

# INSIDE

Software & Services/96

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Communications/108

Systems & Peripherals/112

Price Reductions/114

# CICS management system out

Version 6.2 of The Monitor for CICS has been announced by Landmark Systems Corp. of Springfield, Va.

The Monitor for CICS is an IBM CICS performance management system. According to a company spokesman, Release 6.2 incorporates features such as an interface to IBM's DB2 and SQL/DS data base management systems, allowing users to capture statistics regarding access to both systems from within CICS.

Version 6.2 also includes a CMF utility that allows conversion of Monitor data to IBM's CMF format for use by any CMF-dependent product and enhanced DL/1 sup port, allowing tracking of DL/1 thread us-

Other added features include enhanced

resource limit controls, allowing automatic termination of a task if it exceeds the userdefined thresholds for storage consumption, noncontiguous CPU consumption, total I/O counts and elapsed runtime; an expanded on-line browse feature, allowing on-line display of all transaction detail to include selection by file identification or any one of 62 other selection criteria: dvnamic customization providing object-level CICS release independence; display of Ice/Aids chains; and an optional cancel feature.

The Monitor for CICS is available for a permanent site license fee of \$17,500 for MVS, MVS/XA and VS1 systems. It costs \$8,000 for DOS/VSE systems, according to

# printf("Hello, world\n");

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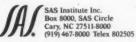
your programming investment across operating environments. Virtually every new computer supports C, and portable programs created with the ainframe compiler under OS or CMS will run on any other machine with a C compiler.

The mainframe compiler uses standard IBM linkage conventions. Assem bler programs, MAIN routines in other high-level languages, and packages such as IBM's ISPF and GDDM can be invoked directly from C. And you can use C, instead of assembler, to develop small and fast subroutines called from

We designed the compiler listing and cross-reference to make programs easy to follow and errors easy to find. An extensive library offers functions from Kernighan and Ritchie and the Lattice PC C compiler. The run-time library produces explicit numbered error messages and a traceback of active function calls if an error occurs.

For all the facts-including details on economical annual licensing complete with free technical support and enhancements-call your Software Sales Representative today.

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# SOFTWARE & SERVICES

### **Systems Software**

Morino Associates, Inc. has announced MICS IDMS Component.

The component is said to collect, organize and store data on usage and performance of Cullinet Software. Inc.'s IDMS Version 5.7 and IDMS/R, running with the IDMS/R Performance Monitor. It provides support for records produced by the IDMS/R Performance Monitor. It generates performance reports in the IDMS environment.

The MICS IDMS Component is licensed for \$6,000 for the initial year and \$2,200 for the renewal year.

Associates, 8615 Morino Westwood Center Drive, Vienna. Va. 22180.

Interactive Solutions Corp. has announced Version 3 of Keygraf/ 3000, an interactive business graphics system for the Hewlett-Packard Co. HP 3000, and has introduced the Keygraf Extended Analysis Option. Keygraf Version 3 updates Key-

graf to work with the HP7440 Color Pro Plotter. The Extended Analysis option provides Keygraf with analytical graphics capabilities including a nontime X-axis type, 16 mathematical functions and 17 additional statistics

Existing Keygraf users can up-grade for \$225. The basic Keygraf system is currently available for a special price of \$295. The Extended Analysis Option costs \$500.

Interactive Solution, P.O. Box 354, cord, Mass. 01742. Woodinville, Wash. 98072

Symbolics, Inc. has released the software source code for its New Flavors object-oriented programming

The code is held in the company's Genera 7.0 operating system and software engineering environment. It erves as a convention and procedure-calling style and a programming language to aid programming.

Prices for the source code are \$100 for American National Standards Institute 9-cartridge magnetic tape, \$75 for cartridge tape and \$25 for IBM Personal Computer diskette media.

Hard copy documentation costs \$50. Symbolics, Four New England Tech Center, 555 Virginia Road, Con-

Daly & Wolcott, Inc. has announced Release 1.0 of its Fixed Assets Accounting System for the IBM System/34 and 36.

Written in RPG II, the software is menu-driven and designed to track fixed assets from entry to retire-

Ten different depreciation methods are utilized and a depreciation journal is automatically produced at month's end. Reports produced by the system include fixed assets listed by asset account, physical location, classification code and date of retire-

The Fixed Asset Accounting System costs \$2,500.

Daly & Wolcott, P.O. Box 1509, East Greenwich, R.I. 02818.



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o find out more, talk with your account executive at AT&T. Or call 1 800 CLP-INFO.



The right choice.

Tandem Computers, Inc. has announced Storelink, an on-line retailing system developed by Signorum, Inc. and Leroux, Pitts & Associates, Inc.

Storelink operates with Tandem Nonstop systems and reportedly does not require the replacement of cash registers or the purchase of a sepa-rate nonintegrated minicomputer.

The software is said to act as the central communications link in a point-of-sale network. It handles growing numbers of transactions and can support on-line in-store terminal systems from many different ven-dors. Applications include flash reporting, credit authorization and price lookup.

Storelink is priced at \$125,000. Tandem Computers, 19191 Vallco Pkwy., Cupertino, Calif. 95014.

New Generation Software, Inc. has announced Interactive Query/ 38, a query system for the IBM System/38.

The software is said to allow users to retrieve and format information without a programming language. Features include the ability to con-nect up to 32 files per query; run que-ries in batch or interactively; format reports on the screen; create System/ 38 files that can be accessed by other applications and queries; sort data; and display data in different column, spacing, text and graphic formats. It can also implement IBM's SQL.

Interactive Query/38 costs \$5,938. New Generation Software, 3840 Rosin Court, Sacramento, Calif.

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Honeywell, Inc. has announced Release 2.05 of its GCOS 4/OS 3, an operating system for its DPS 4 small mainframe computer.

The operating system is built around the vendor's Interactive Data Base System.

According to the vendor, the release features transaction processing with batch capabilities and can handle up to three instruction proces-

The system requires a minimum of 2M bytes of memory and three disk drives. It is available for a license fee of \$600 per month. Honeywell, 300 Concord Road, Billerica, Mass. 01821.



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Good news: Sorbus<sup>®</sup> now services the big IBM<sup>®</sup> 308X series.<sup>®</sup> So you can enjoy all kinds of power, without enduring all kinds of trouble.

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used, future plans, applications and DP executives' names, titles, and phone numbers. An index provides quick access to 133 cross references by hardware, software and industry. Price: NY-\$700, MA-\$395, and NE-\$955. Call (212) 683-0606. Computer Management Research, Inc. 20 Waterside Plaza, NY, NY 10010.

# **NEW PRODUCTS/SOFTWARE & SERVICES**

J. D. Edwards & Co. has announced its World Distribution Systems for the IBM System/38.

The release is composed of Inventory Management, Order Processing and Billing and Purchasing.

According to the vendor, the World Distribution Systems is integrated with J. D. Edwards' other World products, including General Ledger, Accounts Payable and Accounts Receivable.

Each module is priced at

\$20,000 and includes both source and object code, training and full user documentation

J. D. Edwards, Suite 4400, 4949 S. Syracuse St., Denver, Colo. 80237.

### **Applications packages**

Deneb Systems, Inc. has released an item billing module for integration into Revision 3.0 of the Deneb Systems' Construcion Accounting and Estimating System for personal comput-

The item billing module was designed to produce a progress billing by either units or percentage of completion. Features include the ability to track the original estimate, change orders, stored material, units of work complete, bill to date

and retainage.

Prices range from \$895 to \$1.205

Deneb Systems, Suite 2C, 201 Riverside Drive, Dayton, Ohio 45405.

Cycle Computer Consultants, Inc. has announced E/ V-Maint, a software package for equipment and vehicle maintenance.

According to the vendor, the software is said to provide access to current maintenance information.

E/V Maint runs on the IBM System/36 and is priced from \$2,250 to \$4,500.

Cycle Computer Consultants, 29 Continental Place, Glen Cove, N.Y. 11542.

Grocery Technology has introduced Fincalc-36 and Fincalc-38, financial calculation software for the IBM System/36 and 38, respectively.

According to the vendor, features of the programs include printing of amortization schedules and calculation of future values from a stream of payments or present lump sum.

Also included are calculation of internal rate of a stream of payments or future lump sum; calculation of regular payment on a loan; calculation of present value of a stream of payments or future lump sum and calculation of sinking fund deposits.

Each program is priced at \$100.

Grocery Technology, P.O. Box 10054, Atlanta, Ga. 30319.

Sun Microsystems, Inc. and Structural Dynamics Research Corp. have announced that Structural Dynamics' I-Deas mechanical computer-aided engineering and design software runs on the Sun-3 family of technical workstations.

According to the vendor, I-Deas offers an integrated capability for solid modeling and design engineering analysis drafting and testing. It features a project relational data base manager for common access to data across all project applications.

The I-Deas software is available on Sun-3 workstations for multiple users for \$16,600.

Sun Microsystems, 2550-Garcia Ave., Mountain View, Calif. 94043.



# Don't Let Changes Catch You By Surprise.

Uncontrolled changes can cause problems in the operation of a data center. Now you can track and monitor hardware, software, data set, and operational-parameter changes that affect your ability to manage an MVS data center. And you can do it simply and instantly—with DELTAMON®/MVS from Candle Corporation, the makers of OMEGAMON.®

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# !Candle

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Marcam Corp. has announced Prism, a production management and planning software package written in RPG III for the IBM System/38.

Prism consists of several integrated modules, including the foundation module, resource management, resource processor, resource planning, costing, order processing and purchasing.

Features include user-defined vocabulary, a menu-management system, on-line assistance, a training data base and a personal computer interface.

Prism is priced at \$22,000 per module.

Marcam, 19 Crawford St., Needham, Mass. 02192.

Collier-Jackson, Inc. has announced Release 2.02.A of its CJ/Accounts Payable system running on Digital Equipment Corp.'s VAX series of minicomputers.

Enhancement highlights include an on-line Help facility, expanded vendor history and an option to automatically reschedule payables that have missed the discount terms, the vendor said.

Other enhancements include the addition of automatic distribution accounts for sales tax and freight and an additional 1,099 categories and reporting features.

A \$14,000 license fee for the system includes object code, source code, training, installation, documentation and an implementation plan, according to the vendor.

Collier-Jackson, 3707 W. Cherry St., Tampa, Fla. 33607.

Chi/Cor Information Management, Inc. has announced the Chi/Cor Deduction Management System designed to provide users with a method of tracking, monitoring and maintaining deductions claimed by their customers.

The system is said to provide the necessary information both on-line and with batch reports for customer service, claims, promotions, accounts receivable and credit collection. It also provides information on sales service and other departments that are involved with the resolution and collection of billing and payment differences.

The software is written in ANSIstandard Cobol and is available for IMS-DB/DC and CICS/VS, the vendor said.

The system is priced at \$95,000. Chi/Cor, 10 S. Riverside Plaza, Chicago, Ill. 60606.

Software Solutions, Inc. has introduced Facts Release 4.0 of its multiuser package designed for wholesale distribution and general accounting.

Facts runs under Unix or Microsoft Corp.'s MS-DOS, according to the

The package is made up of applications modules including inventory control, orders and invoicing, accounts receivable, sales analysis, general ledger, accounts payable and payroll.

System executive modules include job stream, menu and security, the vendor said.

All modules are menu driven.

The new release features a purchase order processing module, as well as enhancements to the other modules.

Facts Release 4.0 is priced from \$4,000 to \$20,000.

Software Solutions, 1688 Highway 29 S., Lawrenceville, Ga. 30245.

Joiner Associates, Inc. has released Version 2.0 of its Jass software for designing and analyzing two-level factorial experiments.

two-level factorial experiments.

Release 2.0 is said to enable the user to create experimental designs.

According to the vendor, Jass leads the user step by step through the process of designing an experiment.

Other features reportedly include regression analysis, correlations and summary statistics as well as additional data manipulation features such as ubiquitous expressions and data subsetting with BY and WHERE commands.

Jass runs on IBM Personal Computers as well as Digital Equipment Corp. VAX systems under VMS and Unix. It costs from \$895.

Joiner Associates, P.O. Box 5445, 3800 Regent St., Madison, Wis. 53705.

# Languages

Zeta-Soft Ltd. has ported its Zeta-C language compiler and development environment to the Texas Instruments, Inc. Explorer LISP Machine

The Explorer version is a complete implementation of industry standard C. It is compatible with the AT&T Unix System V compiler as well as

the University of California at Berkeley 4.2 Unix compiler, according to the vendor.

The compiler costs \$5,800 for the initial CPU and \$1,000 for each additional CPU.

Zeta-Soft, P.O. Box 139, 94 Sciarappa #2, Cambridge, Mass. 02141.

Softaid, Inc. has announced 64180 Basic, a Basic compiler for the Hitachi Ltd. 64180 microprocessor.

The compiler is said to handle the processor's internal memory management unit, giving the user the ability to write programs up to 1M-byte in length while maintaining CP/M compatibility. It supports multitasking.

64180 Basic costs \$450. Softaid, 8930 Route 108, Columbia, Md. 21045.

# INTELLECT/DB2

# USING AI TO DELIVER DB2 TO MANAGEMENT

Introducing INTELLECT/DB2 — the system that dramatically enhances your investment in DB2 by making DB2 accessible to managers in plain English. INTELLECT/DB2 was developed by Artificial Intelligence Corporation, the pioneer in commercial AI technology and the creator of INTELLECT, the AI-based natural language processing software used by hundreds of organizations worldwide.

Attend this free half-day seminar and learn about the six requirements for delivering DB2 to management.

# 1. NATURAL LANGUAGE

INTELLECT/DB2 allows managers to ask questions of a DB2 database in English. Its use of advanced Al techniques allows users to request information in any way. The system understands ambiguous questions, and lets managers express themselves using their own vocabulary, which it learns as it's used. Al-based natural language delivers DB2 in English, eliminating the need to learn a computer language.

# 2. AD HOC ANALYSIS

INTELLECT/DB2 enables managers to get answers to complex questions easily and see the results in the format they want. Statistics such as totals, minimums, maximums and percentages, and complex functions including correlations and ratios need only be requested. Users see results displayed in summary form or graphs automatically. And they get all this without knowing anything about the database structure, because INTELLECT/DB2 uses AI to handle the details automatically and transparently.

# 3. APPLICATION BUILDING

INTELLECT/DB2 provides facilities to build personal applications in English. Within the system's security constraints, users can create and update tables, build forms for data presentation, and request reports. The system's AI techniques free the user from having to specify the details.

# 4. PROPER USE OF DB2

INTELLECT/DB2 uses all DB2 capabilities such as security, the catalog and indexes to the system's advantage. And as a SQL generator, INTELLECT's interface to DB2 takes full advantage of DB2's power.

# 5. OPEN ARCHITECTURE

INTELLECT/DB2 allows users to employ DB2 databases or other databases and file structures in many additional ways. With INTELLECT's PC Link, they can ask questions in English on a PC, have the results from DB2 reformatted into a Lotus 1-2-3 worksheet, and sent down to a PC. And, advanced work in Al provides voice input to your DB2 database.

# 6. THE RIGHT VENDOR SUPPORT

Our 11 years of experience in delivering commercial AI business solutions to over 450 customers means that you get fast, expert assistance in using INTELLECT/DB2. You have access to complete product support, including a telephone hotline, comprehensive training programs, professional consulting, and tutorial documentation.

Attend this free seminar. See for yourself how using Al can help you deliver DB2 to management. Call our Seminar Registration Office today at (617) 890-8400 to reserve your seat, or return the course.

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Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation.

**AI**Corporation

Artificial Intelligence Corporation | 100 Fifth Avenue Waltham, MA 02254 9156 (617) 890 8400 Telex 989606

Philon, Inc. has released its Fast/ Cobol and Fast/Basic-M languages for the Digital Equipment Corp. VAX series of minicomputers running under the Ultrix operating system.

Fast Cobol is an ANSI 74 compiler said to be compatible with Ryan McFarland Corp.'s RM/Cobol.

Features include record- and filelocking facilities, support of random, sequential and indexed sequential files and the ability to call C subroutines.

Fast/Basic-M is a true compiler said to be compatible with Microsoft Corp.'s Basic.

It features separate module compilation, the ability to call Ultrix utilities from within a program and support of native hardware floatingpoint arithmetic.

Fast/Cobol costs from \$4,500 to \$15,000, and Fast/Basic-M costs from \$3,600 to \$12,000.

Philon, 641 Avenue of the Americas, New York, N.Y. 10011.

# Utilities

Inference Corp. has announced its enhanced C language version of ART 3.0, the company's automated reasoning tool for developing expert systems.

ART 3.0 reportedly speeds up processing and avoids random program halts. It does not require searching for memory because memory allocation and deallocation have already been built into it.

ART also has an added capability called multimethods. This capability is said to combine procedural-based, object-oriented programming as well as rule-based programming.

According to the vendor, the C language version of ART 3.0 is available for Digital Equipment Corp. VAX computers and Sun Microsystems, Inc. Sun-3 workstations. ART 3.0 is also said to be available for the IBM RT Personal Computer.

Pricing for ART 3.0 starts at \$65,000.

Inference, 5300 W. Century Blvd., Los Angeles, Calif. 90045.

Precision Visuals, Inc. has announced extensions to its Addsysa000 graphics software package to support device features in Tektronix, Inc. 4128 and 4129 color graphics workstations.

Addsys-3000 is a subroutine library that is said to provide direct access to local three-dimensional segment instancing in addition to three-dimensional graphics input.

According to the vendor, the Addsys-3000 package also has the ability to manipulate three-dimensional images dynamically on the computer screen.

The package also reportedly allows three-dimensional polygons to be color-shaded to simulate natural lighting effects.

In addition, the Addsys-3000 package is said to provide calls to access the Tektronix sectioning planes by which a three-dimensional object can have a front section removed to show a cutaway of the interior, according to the vendor.

The price for the Addsys-3000 package for use on Digital Equipment Corp. VAX computers ranges from \$1,000 to \$10,500, depending on the

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

Elxai Co. has released the EMS Environment, which allows users of Digital Equipment Corp.'s VMS operating system to migrate to Elxsi's System 6400 parallel multiprocessor.

The products include EMS/ECL, an implementation of DEC's Digital Command Language (DCL) interpreter; EMS/ERT, which provides many of the VMS System Services and runtime library functions; an interactive text editor for VMS that offers complete EDT compatibility; a new release of Elxsi's Fortran compiler for EMS; and a new release of EDMS, the data base management package compatible with RTI Technology, Inc.'s Ingres 3.0.

Both releases are free to current Elxsi customers.

EMS/ERT and EMS/ECL cost \$20,000 packaged together.

The text editor costs \$2,000.

Elxsi, 2334 Lundy Place, San Jose, Calif. 95131.

Bramalea Software Systems has introduced Batchmaster, a batch subsystem for the Prime Computer Corp. Prime Series 50 systems. Batchmaster is said to enable us-

Batchmaster is said to enable users to define, use and monitor the batch environment. It features automatic scheduling of cyclic jobs, flexible use of queues, priority-based reservation of queues, named resources, streaming of sequential jobs and a complete job history.

complete job history.

Batchmaster costs \$2,000 for a site license and \$3,500 for a corporate license.

Bramalea Software Systems, Suite 5014, Interfirst Plaza, 901 Main St., Dallas, Texas 75202. Focus Data Systems, Inc. has announced the Print Control utility for the IBM System/38.

The utility is said to give System/ 38 users control of output queues and print writers.

It features two levels of user defaults and a prompt mode.

Print Control utility costs \$100.
Focus Data Systems, 44 W. Berkshire, Lombard, Ill. 60148.

Interpreter, Inc. has released a document conversion program that is said to allow several dissimilar word processing systems to send documents to NBI, Inc.'s Integrated Workstation.

The Integrated Workstation is said to produce documents containing text, data and graphics. According to the vendor, text can be prepared on a

# Which way wo learn about text ma

# On your own?

For years text management has hovered on the outer fringes of MIS consciousness.

Which is strange, considering how important it is to some of the key people MIS has to serve.

Like company attorneys faced with an unexpected lawsuit.

It's at times like these that text management software has proven its value in organizations all over the world—delivering benefits people didn't even know existed a short while ago, and creating a crescendo of demand at the very highest organizational levels.

What does this mean to you? Several things:

First, it means you'd better understand what text management is all about—before your users do. (Hint: if you're thinking "word processing,"

Second, it means you'd better select a text management system with the features users need to obtain information—plus the features you'll need to maintain system integrity. Users need specialized text search and index facilities conventional DBMS's don't offer; you need database and system control facilities dedicated retrieval systems don't offer.

And third, it means you'd better start evaluating text management systems and vendors without delay. And there's no better way to begin that evaluation than by taking a close look at INOUIRE/Text—the most comprehensive, proven text management software system on the market.

### Text management; It's not word processing. And it's not data management.

Traditional corporate information systems do a great job managing structured data. Unfortunately, the Information most needed by decision-makers is often unstructured—embedded in the text of documents such as letters, memos, reports, contracts, and transcripts. Because this material has traditionally been beyond the reach of online systems, access to it has been slow, tedious, and error-prone. Word processors and other office automation systems have greatly accelerated document creation and distribution, but they are all but useless in making the actual information content of documents available as an online resource.

A text management system fills this need by providing highly sophisticated facilities for online index, search, and retrieval of information in stored documents. With a text management system, users at all organizational levels can pinpoint specific pieces of information within vast volumes of text—instantly. And once they've found the information, they can edit it, combine it, and report it out with complete flexibility.

Not surprisingly, the biggest text management system users have tended to be companies engaged in complex litigation or regulatory proceedings. But as text databases have proved their value in these initial applications, they have increasingly been used in others as well—from competitive intelligence gathering to online maintenance of technical documentation to a full array of corporate records management tasks. And as senior ex-

ecutives have become comfortable with text management facilities, they have increasingly mandated their use throughout the organizations that report to them.

The results: a dramatic improvement in the overall quality of information available to decision-makers. And a dramatic increase in pressure on MIS to deliver top-flight text management capability.

# INQUIRE/Text: The features users need. The control you need.

As the demand for text management capability has grown, so has the number of vendors claiming to provide it. But few of these vendors offer the features, the flexibility, and the track record of Infodata's INOUIRE/Text.

INQUIRE/Text's automatic indexing and powerful keyword search and retrieval facilities have set industry standards in text management for years. INQUIRE/Text's easy-to-use menu screenc, ability to handle both structured and unstructured fields, and flexible interfacing options have made it a hit with users in all departments, while also easing the tasks of the MIS personnel charged with implementing it. And INQUIRE/Text's track record in over \$50 billion worth of litigation support applications—to say nothing of the rest—makes it easy to justify to top management.

INQUIRE/Text: It's the first thing you need to know about text manage

ment.

dissimilar system and transmitted to the Integrated Workstation for further enhancements.

Interpreter-supported and packages include Wang Labora-tories, Inc.'s, IBM's 5520 and Displaywriter and Samna Corp.'s Wordperfect and Wordstar.

Prices range from \$7,500 to

Interpreter, 11455 W. 48th Ave., Wheatridge, Colo. 80033.

Nastec Corp. and Tarkenton Software, Inc. have announced Gammalink, a software product said to automate the systems development

Gammalink provides an interface between Nastec's Designaid personal computer-based structured analysis. design and documentation system and Tarkenton's Gamma host-based application generator, according to the vendor

Designaid features graphics and text for documentation, a design dictionary and analysis capabilities Gamma is also said to feature Cobol code, maps and Job Control Language; an application data base; and screen and report painter

Gammalink costs \$10,000 per site license. Designaid costs \$6,900 and Gamma costs \$186,000.

Nastec, 24681 Northwestern Highway, Southfield, Mich. 48075.

Softlight Corn, has introduced Performance Analyst, a system performance monitor for use with the IBM System/36.

Performance Analyst is said to provide summaries of data collected by IBM's System Measurement Facility. It also features graphs, an exception report, a summary file and a his-

Custom reports can also be created, the vendor claimed.

Performance Analyst is priced at

Softlight, 303 S. Woodrow St., Clinton, S.C. 29325.

Mackinney Systems Co. has an-nounced CICS/CEMT From Batch Release 4.0.

The product allows CEMT commands for CICS to be issued through batch Job Control Language. The version is said to communicate with up to 99 different CICS.

A Header card may be used to direct all commands to a specific CICS or to all CICS systems.

Other features include the ability to use a single command to proces OPENs, CLOSEs, ALLOCATEs and UNALLOCATES of user-defined groups of files, instead of one command for each file.

CICS/CEMT is priced at \$495 for DOS and \$695 for OS/MVS. It is also available for lease

Mackinney Systems, 2674-A S. Glenstone, Springfield, Mo. 65804.

Cosmic has announced the SMU program, a source management utility for managing the development and maintenance of software

According to the vendor, SMU controls an organization of configured data sets that contain source, object and load module files. The user can interactively perform such functions as create, edit, compile, link and load. SMU manages file history data sets.
Using SMU commands, local files

can be compared with the official production version, data set availability can be confirmed and previous program versions can be fully re-

SMU is written in PL/I and assembler for IBM mainframes operating under OS/MVS and supporting ISPF.

Source code costs \$2,500. Documentation costs \$52

Cosmic, The University of Georgia, Computer Services Annex, Athens. Ga. 30602.

Cadre Technologies, Inc. has introduced Teamwork/Access, a data base access and integration tool for use with the Teamwork family of Computer Aided Software Engineering (CASE) tools.

Teamwork/Access is said to allow users to integrate the CASE tools to create an integrated software life cycle support environment. Users can link Teamwork to configuration management tools, code generators, li-brarian tools and more.

Teamwork/Access is priced at \$2,500 per network.

Cadre Technologies, 222 Richmond St., Providence, R.I. 02903.

Advanced Technology, Inc. has announced Version 4.0 of its Digital Equipment Corp. VAX-based interactive design tool, SuperPDL.

Version 4.0 features a full interface to DEC's Code Management System, running under VMS.

It also offers hooks that enable any other configuration management tool to be interfaced to SuperPDL, the vendor stated.

Other features include report modifications, renaming capabilities, an

IDMS users!!

PMDC is an online real-time

and historical

for IDMS DC/UCF systems

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erformance monitor

then on PMDC rentart

# uld you rather nagément software?

# **Orfromyour** legal department?

Today's rising tide of litigation is placing extraordinary demands on corpo-rate legal departments—forcing attor-neys to prepare and manage cases of unprecedented volume, complexity, and public visibility.

In this environment, it's no wonder that so many legal departments are turning to computerized systems to manage critical aspects of their work. And one of the key functions they're looking for is the ability to perform fast, accurate online text searches—a function no system performs better than INQUIRE/Text.

### **INQUIRE/Text: Proven in** companies-and in court.

INQUIRE/Text is a proven, cost-effective system that facilitates the full range of legal department activity— not to mention broader corporate information management strategies.

With INQUIRE/Text, the time and cost of document searches can be sharply reduced. Even more important, INQUIRE/Text can actually enhance professional performancepecially under severe case loads.

By enabling people to share updated information instantaneously. INQUIRE/Text facilitates the preparation of complex cases while minimiz-ing the error potential associated with large volumes of paper documenta-tion. And by tracking key events and costs, INQUIRE/Text contributes to improved efficiency without compro-mising the quality of service provided.

Equally important, INQUIRE/Text is a system proven in some of the most pressing litigation in American history. It's being used right now in

case. And it's been relied on for years in other cases ranging from antitrust -to administrative hear ings before government regulatory

INQUIRE/Text: It's the system legal departments need. It's the system you need to know.

# What works for attorneys can also work for MIS—and others.

You might expect a system as sophisticated as INQUIRE/Text to be difficult for non-DP-oriented users to master. But it's not. Even attorneys who are new to computers find INQUIRE/Text easy to learn and quickly habit-forming. As they become more experienced, they soon discover additional capabilities that can materially enhance their ability to make and present decisions and opinions.

But attorneys aren't the only ones who benefit from INQUIRE/Text. The very features that make INQUIRE/Text so ideally suited for legal applications also serve the needs of other departments such as planning marketing, regulatory affairs, brary—and not least of all, MIS itself.
In fact, INQUIRE/Text is a perfect system for the online maintenance of a wide variety of technical documentation. With its large capacity and flexible database facilities (including automatic backup and recovery, usage monitoring and accounting, and multi-level security), INQUIRE/Text protects the organization's interests while

serving the individual.

This ability to meet both MIS and end-user needs is no accident—it was designed into INQUIRE/Text from the INQUIRE/Text is the place to start your investigation of text management

Speaking of which: if you've read this far, you probably know as much about text management as your law department does. So if they start presenting a case for text management, you've already got a case to present in return. A case for INQUIRE/Text. ◆

INQUIRE®/Text: Text management that works for the legal department. And for MIS.

# INFODATA'

Infodata Systems Inc. 5205 Leesburg Pike Falls Church, 22041 (800) 336-4939 In Virginia and Canada, call (703) 578-3430.

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extended copy function and full support of wild card characters, according to the vendor.

Version 4.0 of SuperPDL is priced from \$14,000 to \$31,000, depending on the VAX model.

Advanced Technology, 19th Floor, 350 Fifth Ave., New York, N.Y. 10118.

Shaw Systems Associates, Inc. has released Problem Report Tracking System, which was designed to document and guide problem-solving procedures on the Hewlett-Packard Co. HP 3000 computer.

Problem Report Tracking System is said to provide on-line data entry and inquiry. It maintains customer contact information along with a record of previous activity.

The system is priced at \$3,700. Shaw Systems, Suite 600, 6200 Savoy Drive, Houston, Texas 77036.

Macro Business Services has announced Macrodoc, an automated documentation tool for the IBM System/38.

Macrodoc is said to summarize data format to record how programs, physical and logical files, libraries and fields relate to each other. Features include external file-field definitions with key fields, ownership and access rights, configuration reports, created files accessible by query and documentation of data files by application.

Macrodoc costs \$500. Macro, Suite 380, 2107 N. First St., San Jose, Calif. 95131. Precision Business Systems Ltd. has introduced the Supervisor Serles, a set of security tools for the Digital Equipment Corp. VAX/VMS. The Supervisor Series is said to

The Supervisor Series is said to monitor and control local and remote terminal usage.

The Supervisor Series reportedly consists of three programs: Photo, Observer and Advisor.

The Photo program logs and plays back a terminal session, and the Observer program allows a user to watch another user's terminal session

The Advisor allows a user to redirect his keyboard so that keystrokes from his terminal are executed in the context of another user, according to the vendor.

The complete Supervisor Series costs \$1,495 with each program priced at \$595.

A site license costs \$1,785 per program or \$4,485 for the series, according to the vendor.

Precision Business Systems, 33 Rector St., New York, N.Y. 10006.

# Data base management systems

Four packages in the Informix line of data base software from Relational Database Systems, Inc. are now said to be available for Charles River Data Systems, Inc.'s Universe line of Unix-based systems.

The four Informix packages include SQL, a relational data base management system based on IBM's SQL, and ESQL/C, providing two sets of tools for developing specialized applications. Other features include C-ISAM, which is said to provide a library of C language functions for creating and manipulating indexed file systems, and File-It, an interactive menu-driven file manager.

According to the vendor, the Informix software costs \$1,600 for SQL. It costs \$1,200 for ESQL/C, \$495 for C-ISAM and \$450 for File-It.

Charles River Data Systems, 983 Concord St., Framingham, Mass. 10701.

Information Dimensions, Inc. has released its Ddlwiz, a program that reportedly will enable its users to define Basis data bases without programming.

Basis is a full-text data management system from Battelle Development Corp.

According to the vendor, Ddlwiz is said to employ a series of friendly, comprehensive screens that users fill in to define standard or long-text data bases.

Ddlwiz can reportedly be used to create single-user data bases, data bases requiring user access as well as data entry security or long-test data bases.

The data bases feature Basis's capabilities, which are said to include automatically stored numbers in segmented files, data conversion and text that can be indexed by phrase, word or full field, according to the vendor.

Ddlwiz is available for Digital Equipment Corp. VAX computers as well as for IBM and Wang Laboratories, Inc. computers.

Ddlwiz is priced from \$1,500 to \$10.000.

Information Dimensions, 655 Metro Place S., Dublin, Ohio 43017.

Tominy, Inc. has announced that it has ported its multiuser Data Base-Plus software system to the NCR Corp. Tower computer series running under the Unix operating system.

Data Base-Plus consists of a logical data base management system, screen handler, print handler and query and report writer, according to the vendor.

As a result, Data Base-Plus is said to provide an integrated environment for application development.

Programming language support includes Cobol, Fortran, assembler, PL/I and RPG.

Data Base-Plus software system for use with the NCR Tower is priced from \$2,500 to \$16,500.

Tominy, 4221 Malsbary Road, Cincinnati, Ohio 45242.

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# **NEW PRODUCTS/MICROCOMPUTERS**

# MICROCOMPUTERS

### **Systems**

ACP International, Inc. has an-nounced the Advanced 286, an IBM Personal Computer AT-compatible

The system includes a full-function keyboard, 200W power supply, clock with battery backup and an Intel Corp. 80286 processor. Other features include eight expansion slots, according to the vendor.

The Model I configuration includes 640K bytes of memory and a 1.2M-byte, 54-in. floppy disk drive. The Model II configuration fea-tures an additional 30M-byte hard

disk drive.

The Advanced 286 is priced from

ACP International, Suite 100, 200 N. Tustin Ave., Santa Ana, Calif. 92705.

Cad Design Systems, Inc. has introduced Cadengine, a computer-aided design system.

Cadengine features Version 2.5 of Autodesk, Inc.'s Autocad and the vendor's Acadplus tablet menu.

The system includes an IBM Personal Computer XT-compatible, 640K bytes of random-access memory, a 20M-byte hard disk, a 360K-byte dis-kette drive and an Intel Corp. 8087 math coprocessor, according to the

Also included are two RS-232 serial ports, one parallel port, Microsoft Corp. MS-DOS 2.1 and a six-pen A/Bsize plotter and digitizer with stylus, the vendor said.

Cadengine is priced from \$5,995. Cad Design Systems, Suite D, 1305 Remington Road, Schaumburg, Ill. 60195.

Apple Computer, Inc. has announced the Apple IIGS personal computer.

The PC features 256K bytes of random-access memory, eight expansion slots and support for the Appletalk network.

It offers seven graphic modes and can play up to 15 voices simultaneously for synthesizing music and speech. According to the vendor, it can run the Apple II family software package without modification.

The base price for the Apple IIGS is \$499.

Apple Computer, 20525 Mariani Ave., Cupertino, Calif. 95014.

# Software applications packages

Franklen Computer Systems, Inc. has announced the SAM-11 sales leads and prospect follow-up soft-ware for IBM Personal Computers and compatibles.

SAM-11 manages the sales followup process from original prospect

Features of the product include user-definable prospect codes and an import/export capability for linking SAM-11 and other spreadsheet or word processing programs, according to Franklen Computer Systems.
The SAM-11 sales leads and pros-

pect follow-up software is priced at \$695, according to the vendor.

Franklen Computer Systems, 456

Central Ave., Glendale, Calif.

Alexander Programming Corp. has announced Cashm, a portfolio management package for IBM Per-sonal Computers and compatibles.

Cashm is said to use linear programming techniques to structure the optimal portfolio to match a stream of liabilities.

Features include user-definable sector constraints, rollover reinvest-ment rates, bond-for-bond swapping and total portfolio reoptimization.

Also featured is a variety of analysis tables, including cash flows, dura-tion, yield and sector and maturity distribution.

The Cashm package is priced at \$10,000.

Alexander Programming, Suite 1624, 420 Lexington Ave., New York, N.Y. 10170.

Bluebird Systems has announced that its Turns application software package for the distribution industry is now available under Superdos, a multiuser operating system for the IBM Personal Computer and compati-

Turns is said to provide major distribution functions such as billing, inventory control, accounts receivable and sales analysis. Superdos is said to support up to 26 simultaneous users and more than 800M bytes of disk storage.

The Turns package is priced from \$2,000 to \$15,000, depending on the system configuration and the modules purchased.

Bluebird Systems, Suite A, 6352 Corte Del Abeto, Carlsbad, Calif.

# Software utilities

Intex Solutions, Inc. has announced XYZ:Spread, designed for use with Lotus Development Corp.'s 1-2-3 or Symphony.

XYZ:Spread is said to transfer data across 1-2-3 spreadsheets. It displays the source and target worksheets together on the same screen and keeps track of source and target locations. It also performs downward allocations.

The software runs on the IBM Per-

sonal Computer and compatibles.

It is priced at \$4,145 for a 12work sheet version with a full trade Continued on page 104

inkahead

At Spectragraphics, we've always had a company philosophy of not just thinking, but thinking ahead. It's something to strive for. And it does more than just sound nice in our corporate brochure.

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For example, last year we introduced the DesignSet 1080,™ a graphics terminal that's compatible with the IBM 5080.

As good as it was at the time, the most important feature of the DS 1080 was its potential. A designed-in potential for growth with easy field upgrades. So every DS 1080, this year's or last's, can have all the most up-to-date fea-tures we have to offer. With complete compatibility and maintainability. Which gives our model a future without planned obsolescence.

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Spectragraphics Corp., 10260 Sorrento Valley Rd. San Diego, CA (619) 450-0611.

# **NEW PRODUCTS/MICROCOMPUTERS**

Continued from page 103 up allowance toward the 1,000-work eet version, which costs \$395, according to the vendor.

Intex Solutions, 568 Washington St., Wellesley, Mass. 02181.

Hawaiian Village Software has announced Turbo Master, a general-purpose screen and application generator for IBM Personal Computers and compatibles

The product is said to generate complete ready-to-run Borland International, Inc. Turbo Pascal programs.

It consists of a master screen edi-tor and generator, a master ISAM data base generator, a master menu generator, master tools, a resident ISAM module and screen-capture utilities, the vendor said.

Turbo Master is priced at \$99.95. Hawaiian Village Software, 1109

Pennsylvania Ave., St. Cloud, Fla.

Macropac International has un-veiled 101 Macros for Symphony, a collection of macros designed for Lo tus Development Corp.'s Symphony software.

The product includes macros that automate the creation of custom-made forms; do project management scheduling; include bold and italic type, page breaks and margin settings in Symphony's sheet mode; sim-plify the steps for record data sort; and insert rows and calculate subtotals in sheet mode.

Other features include macros that address form letters and print labels, create graphic slide shows, speed up recalculation time and add a pop-up

notepad, calendar and calculator. 101 Macros for Symphony costs \$49.95.

Macropac, Suite 168, 19855 Ste vens Creek Blvd., Cupertino, Calif.

# Software data base management systems

Core Analytic, Inc. has intro-duced Visionbase, a family of Dbase III data base software packages that store photographic images that can be linked to textual data.

The program was designed to work with the AT&T Truevision line color photographic digitizing hoards

All packages contain the capability to capture, store and associate

full-color photographs with data base descriptive characteristics so that any retrieval will deliver photographs as well as text information.

The photographs can be output to another device, such as a color printer or slide maker.

Visionbase is priced at \$595 in its stand-alone Image Capture Board

Core Analytic, 674 Rt. 202-206 N., Bridgewater, N.J. 08807.

# Software enhancements

Micro Data Base Systems, Inc. has released Version 2.01 of its Knowledgeman/2 data base.

Version 2.01 is said to run faster and allow for larger data base applications.

The number of records per table for IBM PC-DOS and Microsoft Corp.
MS-DOS is increased to over one million, the vendor said. Version 2.01 also supports the IBM Enhanced Graphics Adapter.

Other features of Knowledgeman/ 2 are single-keystroke menu selection and the ability to build a library of customized functions and create menus automatically.

It costs \$695 and runs on most personal computers with a minimum of 512K bytes of random-access memory and a 2M-byte hard disk.

Micro Data Base Systems, P.O. Box 248, Lafayette, Ind. 47902.

Softcraft, Inc. has announced Re-lease 3.0 of the Xtrieve on-line data retrieval system.

Xtrieve is a menu-driven, data base query tool that allows users to provide an interface to applications developed with Softcraft's Btrieve file management system. Xtrieve 3.0 allow users to customize menus. Help files and error messages to the language of the customer and the specific applications.

Other features of Xtrieve 3.0 include the addition of password security and user access to view up to eight files at one time instead of four.

Xtrieve requires MS-DOS 2.0 or 3.0. It costs \$245 for the single-user version and \$595 for the local-area network version.

Softcraft, P.O. Box 9802, #917, Austin, Texas 78766.

Haar Industries, Inc. has announced the 5XM release of MUC-DOS, a multiuser, multitasking real-time Microsoft Corp. MS-DOS multitasking compatible operating system for IBM Personal Computer XTs, PC ATs and compatibles.

The new release offers real-time, multitasking support for up to twelve multipage workstations, 8M bytes of random-access memory, 500M-byte hard disks, multiple hard disks, five system printers and additional dedi-

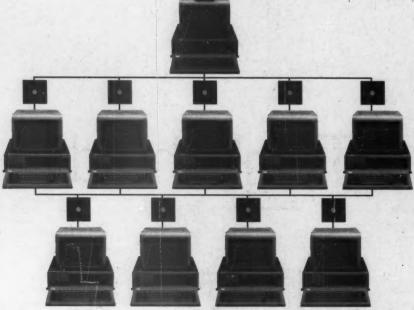
cated printers.

MUC-DOS is priced from \$495 to MUC-IVES is priced from \$495 to \$1,795 as an upgrade kit and \$6,200 to \$20,500 as a preconfigured sys-tem, according to the vendor. Haar Industries, 2600 Virginia Ave. N.W., Washington, D.C. 20037.

Softcraft, Inc. has announced Re-lease 3.0 of the Xtrieve on-line data retrieval system.

Added features include the ability Continued on page 106

If you can't put a Hayes modem on every PC in your IBM network, here's the next best thing.



It's new communications software from Hayes called Smartcom II\* for the PC Network.

It lets you share modems. So even PC's without their own modems can communicate outside the network.

Before now, if you needed to communicate outside the network, you had to physically go to wherever the modern was. That, in turn, meant bumping the operator off his modem-equipped PC, so that you could handle your communications.

Hayes Smartcom II for the PC Network puts an end to all the delay and inconvenience. Now, when a PC needs the modem, the user is automatically connected from his own desk. So communications

capabilities are immediately available to everyone on your network, whether their PC has a modern or not.

You only buy one software package per modem. The workstation part of the software can then be duplicated for each PC on the network, at no extra cost. It's better than

having a site license! Each PC can have its own pass word, define its own log-on proce-dures, set its own macros, and use

Say yes to the future

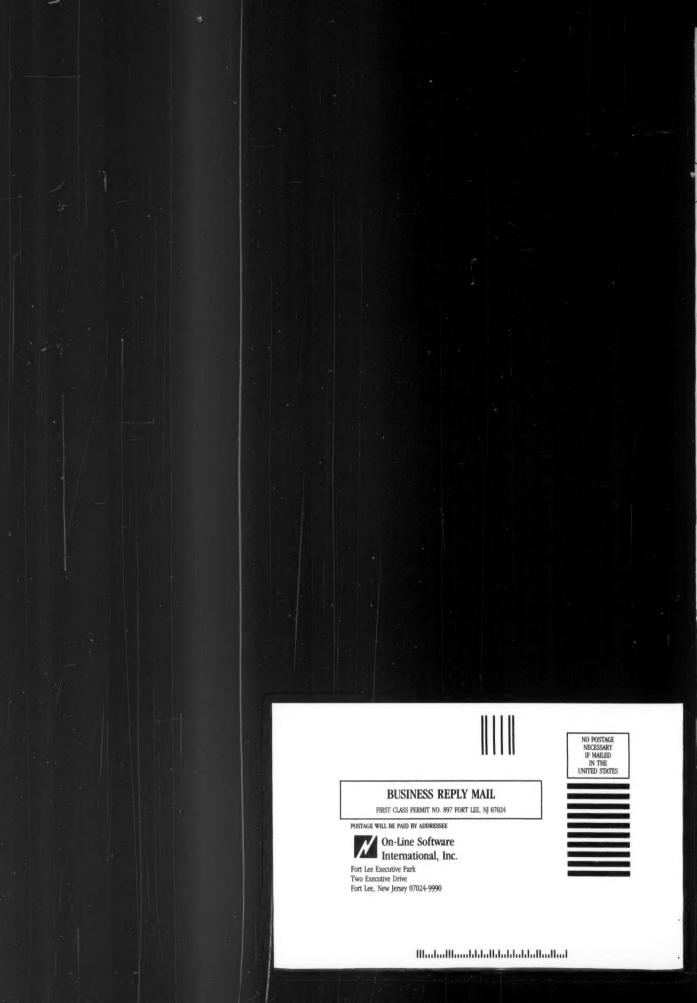
all the other outstanding operating features of our standard Smartcom II while connecting with any of the shared modems on the network. You get all this for only \$599\*! And it's backed by Hayes, the PC communications leader.

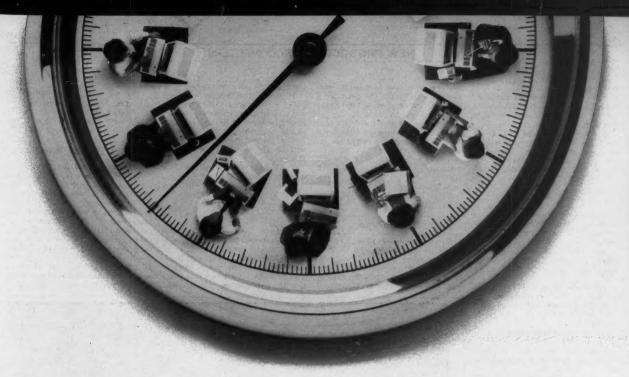
So if you currently utilize, or contemplating adding, IBM PC networks, you should also add Smartcom II for the PC Network. For efficient communications.

Without delay.
See your authorized Hayes dealer for details. Or contact Hayes at 404/441-1617.

Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, Georgia 30348.

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# Deliver quality CICS applications and meet deadlines every time.

VERIFY, now in Release 2.2.1, is an automated quality assurance system that lets you deliver reliable applications without spending long hours re-keying test inputs and visually comparing test outputs. Because it provides fast and accurate checking of CICS applications, VERIFY helps you introduce new and updated programs (as well as migrate to CICS Release 1.7) without missing a beat.

# STABILIZE"/CICS.

# Increase system availability by 90%.

STABILIZE prevents CICS "crashes" before they occur by detecting and automatically repairing the

system corruption that causes them. With STABILIZE, you can reduce system outages by a phenomenal 90%! Its concise, on-line diagnostic reports allow you to quickly pinpoint the cause of a problem, so you can make sure it never happens again.

# InterTest.®

# Speed CICS testing and debugging.

The industry standard with over 2,000 users worldwide, Interflest is an interactive testing and debugging aid that prevents downtime and increases programmer productivity an average of 46%. Four kinds of breakpoints handle all your testing needs. And with Interflest's new Release 2.5, the program is now even faster and easier to use.

# DataVantage."

# Develop and test IMS and DL/1 data bases quickly and easily.

With Dataliantage, you can create reliable test data bases and manipulate them with ease, down to the field level. The program automatically provides complete and accurate subsets of data bases, eliminating incomplete samples and the need to write "one-time-only" programs. Databantage helps you quickly resolve all logical relationships between data bases before installing your application in production mode.

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# **NEW PRODUCTS/MICROCOMPUTERS**

Continued from page 104 to write customized menus, password security and a built-in report writing option. The Xtrieve documentation has been expanded as well.

Xtreive 3.0 is priced at \$245 for the single-user version and \$595 for the local-area network version. Current users can upgrade for \$40. Softcraft, P.O. Box 9802, #917,

Austin, Texas 78766.

Compuview Products, Inc. has announced Vedit Plus, an upgraded version of its word processing text editor

Vedit Plus allows users to split the screen into several windows of different size and shape, the vendor said.

The windows can be used simultaneously for functions such as program development, multiple-file editword processing and spell checking.

Pop-up menus have also been addba

Vedit Plus is priced at \$185. Users of previous versions can upgrade for

Compuview Products, Suite 300, 1955 Pauline Blvd., Ann Arbor, Mich. 48103.

Systat, Inc. has announced Systat 3, an upgraded version of its statistical package for personal computers.

New procedures include nonlinear estimation, repeated measures and discriminant analysis, the vendor

Other enhancements of the package include the Systat Executive, which offers menu and batch execution of Systat modules, new statistical routines and an expanded and revised manual.

Version 3 also introduces a fullfeatured statistical package for the Apple Computer, Inc. Macintosh.

Systat 3 costs \$595. Current users can upgrade for \$75.

Systat, 2902 Central St., Evanston, Ill. 60201.

# Communications

Dayna Communications, Inc. has announced a FT100 file transfer de-

The FT100 is said to transfer data between 5¼-in. Microsoft Corp. MS-DOS disks and the Apple Computer, Inc. Macintosh system through either an RS-232 serial port or a small computer system interface port.

This allows MS-DOS data to be used within any Macintosh applications program, according to the ven-

The FT100 works with either a Macintosh 512K or a Macintosh Plus. The transfer process includes a choice of text, binary or Macbinary formats

The FT100 is priced at \$595 in the 514-in. disk drive version.

Dayna Communications, Suite 530, 50 S. Main, Salt Lake City, Utah 84144.

Curtis, Inc. has announced Softport, a software switchable, serial/ parallel port adapter for the IBM Personal Computer and compatibles.

Softport is said to allow one of the serial ports to

switched to one of four output connectors, eliminating the need for a hardware switch box or unplugging and plugging connectors.

Switchport is a half-size card that provides one Centronics Data Computer Corp. parallel port and one serial RS-232 port.

The switching program can be run manually or incorporated in a batch

Softport is priced at \$195. Curtis, 22 Red Fox Road, St. Paul, Minn. 55110.

# Data storage

Micro Technology, Inc. has un-veiled its MQD12 Winchester disk drive controller.

The controller reportedly supports up to four 5¼-in. ST506 Winchester disk drives on Digital Equipment Corp. Q-bus-based computers.

Diagnostic functions such as loop-back, buffer and a variety of read and seek tests are stored on the controller in nonvolatile random-access memory, according to the vendor.

The controller can be modified without the need for switches or

jumpers.
The MQD12 Winchester disk drive controller costs \$1.495.

Micro Technology, 1620 Miraloma Ave., Placentia, Calif. 92670.

Maynard Electronics announced the Maynstream 60 tape backup system in cassette version.

The Maynstream 60 is said to allow users to save up to 60M bytes of data on single 1/6-in. tapes. It is avail-able in both portable and internal versions

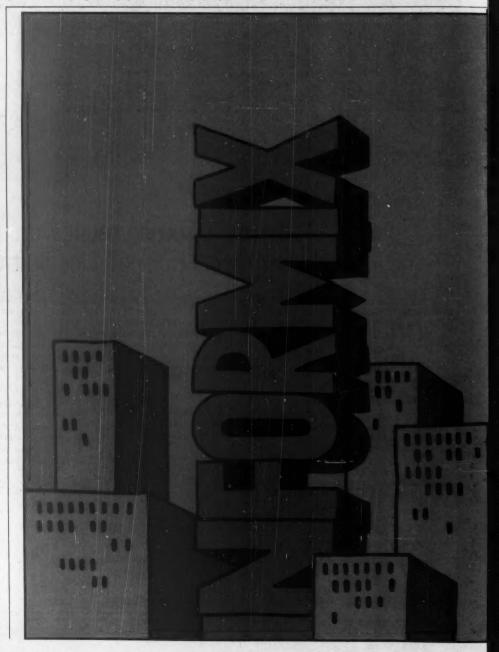
The Maynstream 60 portable is priced at \$1,595. The internal version costs \$1,195.

Maynard Electronics, 460 E. Semoran Blvd., Casselberry, Fla. 32707.

# Printers/Plotters/Peripherals

Design Computation, Inc. has re-leased DC/Autorouter II, a diagonal autorouter for IBM and AT&T personal computers and compatibles

DC/Autorouter supports 45-de-gree routing as well as pad sizes and trace widths, off-grid placement of pad and vias and user-selectable routing options, the vendor said. Another feature is a switch that allows the user to select between even distribution of routes across all layers or biased routes for the densest routing on the outer layers to facilitate



# **NEW PRODUCTS/MICROCOMPUTERS**

debugging. It allows manual routing of critical traces before, during or after running the autorouter.

DC/Autorouter II costs \$2,450. Current users will receive a free upgrade.

Design Computation, 10 Frederick Ave., Neptune, N.J.

Printronix, Inc. has announced the Personal Laser Printer, a laser printer that was designed for desktop personal computer-based applications.

The printer offers 12 page/min. printing with 300- by 300-dot/in. resolution. It is compatible with the Diablo 630 from Epson America Corp., with IBM Graphics, Hewlett-Packard Co.'s Laserjet and Laserjet Plus.

The Personal Laser Printer has a

250-sheet automatic paper feeder cassette plus a second 50-sheet tray. It comes standard with six fonts.

The Personal Laser Printer is priced at \$2,995.

Printronix, P.O. Box 19559, 17500 Cartwright Road, Irvine, Calif.

Hewlett-Packard Co. has announced the Draftpro eight-pen plotter for personal computer-aided design applications.

The plotter creates multicolor output on architectural and engineering C/D-size and metric A1/A2-size paper, vellum or polyester film, the vendor said

It comes standard with an RS232-C interface.

The Draftpro plotter is priced at

\$5,400.

Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

# **Board-level devices**

Access Associates has introduced Alegra, a memory expansion unit for Commodore Business Machines, Inc. Amiga Personal Computer.

The Alegra expansion unit is said to add 512K bytes of external memory to the Amiga PC.

The use of semi-custom logic and a printed circuit design allows for future expansion to 2M bytes by replacing memory and configuration devices, the vendor stated.

Power is supplied to Alegra by the Amiga at the expansion connector, the vendor said.

Total power consumption is said to be less than 5W.

The Alegra expansion unit is priced at \$379.

Access Associates, 491 Aldo Ave., Santa Clara, Calif. 95054.

Intercontinental Micro has introduced the CPS-Q6A, a four-on-one application processor slave board.

The CPS-Q6A contains four 8-bit, 6-MHz banked slaves and is upgradeable to 10 MHz.

Each slave has a Z80B-compatible HD64180 CPU, two serial I/O ports and 128K bytes of on-board, random-access memory. The board draws 2.5 amps on the 8-volt line.

Four RS-232 serial interface cards are said to provide additional printer support.

The CPS-Q6A is I/O mapped and can work as either a slave or an I/O processor, according to the vendor.

The CPS-Q6A slave board is priced at \$1.995.

Intercontinental Micro, 4015 Leaverton Court, Anaheim Calif. 92807.

Zaki Corp. has introduced the Memory Share board, said to expand the memory of an IBM Personal Computer, PC XT or compatible to one megabyte.

The Memory Share board comes with two banks of 384K bytes of memory and an RS-232 serial port.

According to the vendor, by employing bank-switching technology, Memory Share maintains the entire memory address within Microsoft Corp.'s MS-DOS address space of 640K bytes.

With Memory Share in the system, one user can run programs requiring 640K bytes, while a second user can run programs up to 448K bytes, the vendor said.

Memory Share is priced at \$395. Zaki, Maple Technology Park, 420 Maple St., Marlboro, Mass. 01752.

Pronto Computers, Inc. has introduced its HR-1200 series of IBM Personal Computer-compatible color graphics boards.

The boards reportedly provide flicker-free graphics at 1,280- by 1,024-pixels with either 8-bit, 256 color display or 4-bit, 16-color display from a palette of 4,096 colors.

The graphics boards include a 256by 12-color look-up table, three highspeed digital/analog converters and 1.5M bytes of memory per screen image.

The 1,280- by 1,024-pixel version with 256 simultaneous color display capability costs \$3,495 and the 1,280- by 1,024-pixel with 16-color capability costs \$2,795, the vendor said.

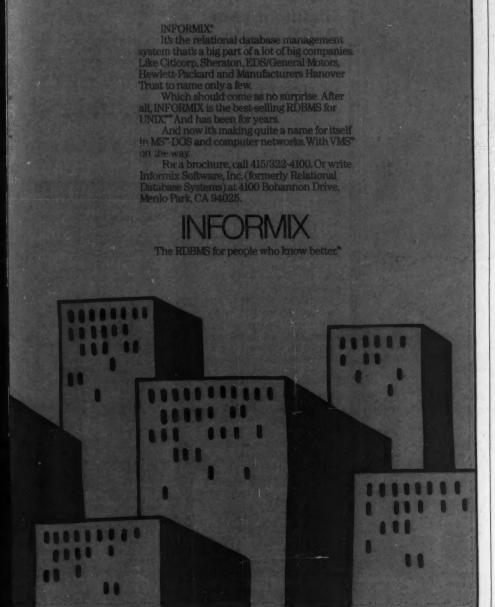
Pronto Computers, 3730 Skypark Drive, Torrance, Calif. 90505.

Adax, Inc. has introduced its PC-SDMA, synchronous direct-memory

access serial controller.

It is said to be for the IBM Personal Computer, PC AT and RT Personal Computer running Microsoft Corp. Xenix or AT&T Unix System V that features multiple protocol control on two popular interfaces.

The board operates on either RS-232C or RS-449 interfaces. It also Continued on page 108



# **NEW PRODUCTS/MICROCOMPUTERS**

Continued from page 107 supports multiple low-level commu-nications protocols on Xenix. For higher baud rate applications, the PC-SDMA with RS-422 drivers and receivers is capable of 1M bit/sec., the vendor said.

The PC-SDMA board costs \$790,

according to the vendor.

Adax, 77 Dwight Way, Berkeley, Calif. 94710.

Definicom Systems, Inc. has introduced the MMM, a 32-bit graphics board family for IBM Personal Computers and compatibles.

The MMM board features an additional 144-pin interboard connector block that is separate and independent of the normal motherboard edge connectors.

Minimum clock rate is 16.7 MHz, resulting in a 50-MHz pixel update rate, the vendor said. The board family consists of two computing engines ased on the 68020 CPU and 68881

floating point unit.
The DSI-780 and the DSI-020 can both be clocked at rates up to 20 MHz. The graphics extender board is programmable for pixel configuration.

The DSI-020 (16 MHz) costs \$1,994; the DSI-780 at 16 MHz costs \$3,295; and the graphics extender board costs \$1,495.

Definicom Systems, Suite 108, 31324 Via Colinas, Westlake Village, Calif. 91362.

Dolen Computer Corp. has introduced the DC1-8 graphics add-on board for IBM Personal Computer

XTs, PC ATs and compatibles.

The graphics board is equipped with 1M byte of memory and a triple, 6-bit color palette for a selection of over 260,000 colors, the vendor said.

It uses one expansion slot and has an 8 MHz graphics coprocesor chip that performs drawing operations such as vectors, ellipses, shapes and hitting and clipping.

The board can reportedly be con figured for a variety of resolutions from 640 by 480 pixels up to the maximum limits determined by the hard-

The DC1-8 graphics board costs \$2,895.

Dolen Computer, P.O. Box 599, Norwalk, Conn. 06856.

May-Craft Information Systems,

Inc. has announced the 286 Expres Card, a half-slot accelerator for the IBM Personal Computer and PC XT.

The 286 Express is said to replace the 8088 chip found in an IBM PC or XT with an 80286 microprocessor, allowing it to run faster than the standard PC AT.

According to the vendor, an 8Kbyte cache memory feature provides zero-wait-state access to most used code and data.

With the card, all exisiting random-access memory, hardware and peripheral cards can be used without software modification, the vendor said.

The 286 Express is priced at \$595. May-Craft Information Systems, 4312 Beltwood Pkwy. S., Dallas, Tex-

# Highlight your DASD problems to gain better online performance!

**DASDMON** highlights critical DASD I/O contention problems easily and comprehensively at your MVS or MVS/XA installation. DASDMON identifies the problems and also offers solutions via online displays and reports. It provides all the relevant details of DASD performance from the system level to dataset and job levels. DASDMON makes it easy to improve DASD I/O response time and gain better online performance.

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DUQUESNE

Two Allegheny Center Pittsburgh, PA 15212 (800) 323-2600 (412) 323-2600 Inside PA Apparat, Inc. has introduced the Limbo II, a 1.28M-byte expanded memory and multifunction board.

According to the vendor, Limbo II can fill system memory to 640K bytes and use up to 1.28M bytes of random-access memory (RAM) for expanded memory. Limbo II comes with software that can support up to two boards and is compatible with Lotus Development Corp., Intel Corp. and Microsoft Corp. Expanded Memory Specification.

Other features include a serial and parallel port, clock/calendar and game adapter.

The Limbo II costs \$299 with 256K bytes of RAM installed or \$499 with

1.28M bytes of RAM. Apparat, 6801 S. Dayton, Englewood, Colo. 80112.

# COMMUNICATIONS

# Voice/data communications

The PBX Systems unit of ITT Business & Consumer Communica-tions division has announced the ITT PBX press, an enhancement to its System 3100 digital voice/data priautomatic branch exchange (PABX).

The product is a voice/mail system said to provide voice messaging capabilities as an adjunct to the System 3100 or other PABXs. It supports up to 1,000 users and broadcasts m sages to 125 users, using a standard touch phone

It is available with storage capacities from five to 30 hours and supports from two to 14 ports.

Pbxpress is priced from \$28,000 to

ITT, 6131 Falls of the Neuse Road, Raleigh, N.C. 27609.

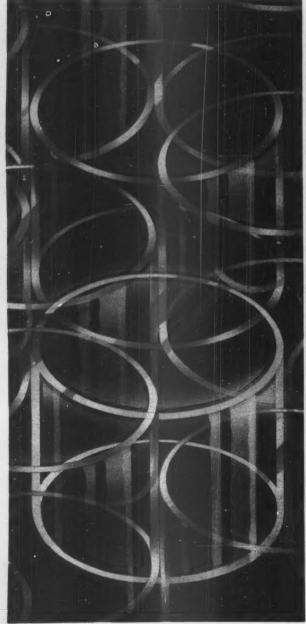
Dynapac Systems Co. has announced the Secure Access Directory System (SADS), a call-validation feature for its PSX family of packetswitching exchange

SADS is said to be a data base survisor that operates on PSXs to validate IDs and passwords from the users of network terminals.

The SADS software can operate on the Dynapac PSX Network Control Center or can be distributed to additional PSX nodes.

SADS costs \$7,500 for the first copy and \$2,000 for each additional

Dynapac, 5350 Shawnee Road, Alexandria, Va. 22312.



# Watch what happens next time you ask a mainframe software vendor for a complete customer list.



You may get a convincing song and dance, but underneath it's a different story. Behind those pat answers that software vendor is actually sweating and squirming.

Why don't they want you to see a complete list? Simple. They know that their size and name familiarity do not guarantee happiness. Many "single source" or "all-things-to-all-people" vendors have, at best, uneven quality across a multi-application product line. They know that their customer list may contain a good number of less-than-happy clients. It's difficult for these vendors to commit the human and monetary resources necessary to produce the type of superior product available from a firm that specializes in a single application area. A firm like Data Design.

Data Design develops mainframe financial applications software. Period. We understand all our users' requirements and are therefore able to provide the necessary support: over 40 percent of our support and installation staff are CPA's or have MBA's.

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customers a complete customer list. That's because hundreds of FORTUNE 1000 companies have reaped exceptional results from our financial software systems. Alcoa, Gerber, Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank; The New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds more have opted for Data Design over other major vendors. Write for our complete customer list and ask anyone on it about our fast, trouble-free implementation; system flexibility and ease of use; in-depth training and responsive, knowledgeable support; management level people in customer service positions, and more.

You'll find that people who want financial software relief choose Data Design. Since 1973, nationally recognized independent software surveys have confirmed Data Design's unsurpassed record of user satisfaction—year after year. That's why we'll give you a complete customer list—and they

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frame financial software for your company, put Data Design on your list. Then tell the other vendors on it you're also looking at Data Design. And watch what happens.

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# NEW PRODUCTS/COMMUNICATIONS

Micom Systems, Inc. has intro-duced the Instanct6000 Series 20 data private branch exchange

Using twisted-pair wiring, it serves up to 250 channels with simultaneous data transmission at rates up to 19.2K bit/sec.

The data private branch exchange allows terminal and personal computer users to access one or more minicomputers without direct wiring to each resource.

The Instanct6000 Series 20 cos \$44,500 for a 34-channel unit. A fully expanded 250-channel system costs \$77 per channel.

Micom Systems, 20151 Nordhoff St., Chatsworth, Calif. 91311.

# Multiplexers/Moderns

Canoga-Perkins has announced the 3272 18 to 144 channel fiber optic multiplexer.

Designed for point-to-point local communication applications, the multiplexer is said to handle asynchronous and synchronous speeds up to 76.8K bit/sec. It features standard SMA connectors and diagnostic capacities

Other features include stand-alone rack-mounted versions and full duplex operation.

Units range in price from \$2,350 to

Canoga-Perkins, 6635 Independence Ave., Canoga Park, Calif.

Canoga-Perkins has announced the Model 3248, a fiber-optic T1 multiplexer

The 3248 can reportedly replace

up to eight local T1 links. The 3248 comes with a choice of two interfaces: T1 or V.35. The T1 interface is compatible with standard AMI or B8ZS coding and utilizes DB-15 con-

The V.35 interface features both external and internal clocking

The 3248 provides local and remote loopback tests. It can be installed in stand-alone or rack-mount-

ed versions, according to the vendor. The 3248 costs from \$3,000 to

Canoga-Perkins, 6635 Independence Ave., Canoga Park, Calif. 91303

Racal-Vadic, Inc. has introduced

the VA4891, a synchronous, 4.8K bit/

sec, rack-mounted modem designed

for use with the MDS-II Network Management System in two-wire dial-up or four-wire leased line applications

The modem is AT&T 208 and V.27 compatible, provides autodialing and utilizes the capabilities of the MDS-II System Controller, including monitoring and reporting of telephone line

impairments.
Each MDS-II chassis can accommodate up to 16 VA4891 modems.

The VA4891 costs \$1,395 McCarthy Racal-Vadic, 1525 Blvd., Milpitas, Calif. 95035.

Racal-Vadic, Inc. has announced the 7556 Synchronous Multiplexer designed for use on 56K-byte Dataphone Digital Services (DDS) circuits.

The six-channel multiplexer is available with or without an integral DSU/CSU. All six channels are protocol independent. With the DSU/CSU, the multiplexer is equipped with a modular connector; the 7556 without DSU is equipped with a V.35 inter-

The 7556 costs \$1,495. With the

DSU, it costs \$1,990. Racal-Vadic, 1525 M Blvd., Milpitas, Calif. 95035. McCarthy

Equinox Systems, Inc. has announced the Interswitch multiplexer boards, T1- and CCITT-compatible integral multiplexers, for use with its data private branch exchanges

The plug-in boards are said to tie several Equinox data private branch exchanges together, either locally in campus environments or remotely in different cities using telecommunications T-carrier facilities

The T1 multiplexer board provides connections and operates at 1.544M bit/sec. The CCITT-compatible multiplexer board conforms to the European G703 specification, provides 180 connections and operates at 2.048M bit/sec

The boards cost \$5,000 each. Equinox, 12041 S.W. 144th St., Miami, Fla. 33186.

Cable & Wireless Carterfone has added the Adcomm Plus to its Adcomm H series of interactive, asynchronous modem/multiplexers.

The Adcomm Plus, said to provide up to 19.2K bit/sec. throughput, adds the capability to communicate in originate and answer modes

Two versions are available. The Adcomm Plus-1 is priced at \$1,695. The Adcomm Plus-2, which provides an independent statistically multi-plexed printer channel, costs \$1,995.

Cable & Wireless Carterfone, 1341 Mockingbird Lane, West Tower, Dallas, Texas 75247.

Able Computer has announced Mux Master Multicluster, a Digital Equipment Corp.-compatible multiplexing system.

The Mux Master Multicluster is said to permit up to 128 user lines to be terminated in a rack-mountable housing only 171/2-in. high by 19-in. wide by 10-in. deep.

The concentrated lines are con-nected to a DEC VAX or Microvax II host computer via a single twistedpair link cable.

# Life-sized COBOL

SORT 10,000 100-byte records in 43 seconds. Load 10,000 100-byte keyed records in 36 seconds. Compile a 10,000 line program in 76 seconds. Search a 10,000 line source file in 16 seconds.

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REALIA is the fastest micro COBOL. It can handle the biggest files. But speed and capacity are only the basics. The compiler, GSA-certified at the high level, offers IBM VS COBOL compatibility and supports ANSI 85 features. such as inline PERFORM and END-IF.

COBOL programs can call DOS, C, and assembler subroutines, as well as accessing BIOS functions via the machine-level interface. The indexed file system handles multiple alternate indexes, with a maximum record

size of 32Kb. The interactive symbolic debugger works on your native generated code, instead of requiring an interpreted version. The full-screen editor imposes no

The programs you write are yours to distribute: REALIA charges no run-time or royalty fee.

REALIA gives you the tools you need for real-life development and maintenance projects. Fast, high-quality phone support. Automatic shipment of upgrades, free for the first year. An introduction to the independent REALIA User Group. A 30-day evaluation copy, for qualified companies. Call us.

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REALIA" COBOL requires MS-DOS" 2.00 or above; an IBM PC" PC-XT", PC-AT", 3270 PC", or competible; and at least 160kb of memory.



# **NEW PRODUCTS/COMMUNICATIONS**

Multicluster is configured with up to eight cluster con-troller boards, each supporting 16 users.

Multicluster costs \$500 in addition to the Mux Master configuration.

Able Computer, 300 Airway Ave., Costa Mesa, Calif. 92626.

Micom Systems, Inc. has unveiled the Box Type T and Box Type 4 time-division multiplexers, said to multiplex up to eight synchronous data lines over a single wide-band composite link at speeds up to 72K bit/sec.

The Box Type T offers wideband synchronous time division multiplexing alone, and the Box Type 4 also offers asynchronous statistical multiplexing.

All channels are full-duplex and can be individually

programmed.

Micom Box Type T is priced from \$1,695, and the Box Type 4 costs from

Micom Systems, 20151 Nordhoff St., Chatsworth, Calif. 91311.

Racal-Vadic, Inc. has announced the 4850P 4.8K bit/ sec. synchronous modem with a multiprotocol autodialer.

The modem provides Bell 208 and CCITT V.27 compatibility, four integral automatic dialers and upgradability to 9.6K bit/sec, according to the vendor.

The automatic dialer reportedly supports 801-type parallel automatic calling parallel automatic calling and IBM 3270 Synchronous Data Link Control, HDLC and 3780 bisynchronous serial dialing protocols.

The 4850PA costs \$1,295. Racal-Vadic, 1525 McCarthy Blvd., Milpitas, Calif. 95035.

# Local-area networks

Cross Information Co. has announced Cross/Point LAN, a version of its Cross/ Point conferencing system.

The product provides electronic mail, conferencing, bulletin board and memo networking in a Novell, Inc. local-area network or Novellcompatible environments. Cross/Point is written in C for Microsoft Corp. MS-DOS and IBM PC-DOS, many C

TRACE your **CICS** programs **ONLINE** as they execute with TRACER from Data Tools, For info call (215) 444-4503.

compilers and Unix operating environments.
Cross/Point-LAN is priced

at \$695 per site.

Cross Information Co., Suite 311, 1881 9th St., Boulder, Colo. 80302.

Sercon Corp. has an-nounced the Bankon EFT Switch for the banking in-

The switch is said to operate under IBM's CICS/VS te-

leprocessor monitor. According to the vendor, it provides banks with the ability to offer regional switching among banks. Features supported include 24-hour availability for message routing, on-line network control and network monitoring, resettlement reporting between local and remote centers, fee calculation, automatic reversal genera-tion and debit/credit card

The Bankon EFT Switch is priced from \$150,000 to

Sercon, 4611 N. Lindhurst, Dallas, Texas 75229.

Summation, Inc. has announced its Sigmanet product line, said to bring networking capabilities to custom automatic test equipment (ATE) systems.

A Sigmanet station con-sists of custom ATE hardware, the vendor's Testwindows 2.0 software and the

Digital Equipment Corp. Vaxmate. Features include turnkey networking using thinwire Ethernet, automatic file transfers between DOS and DEC systems, statistics for total quality control pro-grams, centralized data analysis and test program revision control.

Sigmanet programming priced from \$10,000

Summation, 11335 N.E. Way, Kirkland, Wash.



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**Triangle Software Company** 

4340 Stevens Creek Blvd., Suite 275 San Jose, CA 95129

# **NEW PRODUCTS/COMMUNICATIONS**

Intermec Corp. has announced the 9191 Satellite Wand Station for use with two of the company's bar code readers.

The 9191 Satellite Wand Station and wand are both said to provide a means of bringing a data entry station to every person, according to the vendor

Up to 10 units can be used with just one of the bar code readers.

A series of 9191s can be

networked in a daisychain, the vendor said.

The 9191 Satellite Wand Station and wand cost \$364.

Intermed Corp., P.O. Box 360602, 4405 Russell Road, Lynwood, Wash. 98046.

Telebyte Technology has upgrad-

ed its Netscope 5-in. CRT-based data line monitor.

Added features include IBM Synchronous Data Link Control and CCITT X.25 communications protocols, intelligent decoding to level 2 of these protocols and visual monitor output, according to the vendor.

The CRT display is presented in a split-screen, full-duplex, time-correlated format, the vendor said

Netscope is priced at \$1,800. Telebyte Technology, 270 E. Pu-laski Road, Greenlawn, N.Y. 11740.

# SYSTEMS & PERIPHERALS

# **Processors**

Clearpoint, Inc. has announced the DNXRAM family of add-in memo-

ries for the Apollo Computer Corp. DN 3000 series of computer workstations

single-card m available with 1M- or 2M-byte capacities, according to the vendor.

The access time is 120 nsec. The boards use zigzag, in-line, packaged 256K-byte dynamic random-access memories.

The 1M-byte card costs \$750 and the 2M-byte card costs \$1,495, the vendor said.

Clearpoint, 99 South St., Hopkinton, Mass. 01748.

Clearpoint, Inc. has introduced the ETRAM/4, offering 4M-byte ca-pacity, and the ETRAM/8, offering 8M-byte capacity, for the IBM RT Personal Computer.

The memories support both the RT PC Error Detection and Correction logic, according to the vendor.

Each board is organized as two 40bit arrays to allow interleaved opera-tion. The boards have access times of 150 nsec, the vendor said.

The RTRAM/4 costs \$1,895, and the RTRAM/8 costs \$4,395. Clearpoint, 99 South St., Hopkinton, Mass. 01748.

# **Graphics systems**

Advanced Electronics Design, Inc. has announced the Colorware Cards Graphics Display Systems for Q-bus and VMEbus environments.

The systems feature display list processing, an internal window management system, multiple concurrent text and graphics windows, according to the vendor.

Features include a two-board set featuring 1,280- by 1,024-pixel resolution and four or eight planes offering 16 or 256 simultaneously dis-

playable colors.
The 1280Q-GDS designed for the Q-bus costs \$5,495 for a four-plane model and \$6,495 for an eight-plane

model, the vendor said.

The 1280V-GDS for the VMEbus costs \$6,795 for the four-plane version and \$7,995 for the nine-plane version.

Advanced Electronics Design, 440 Sunnyvale, Calif. Potrero Ave., 94086.

Gespac, Inc. has announced the Gesvig-4, a graphics controller built on a single-height eurocard and compatible with the G-64 bus.

The controller is said to be fully programmable and can display up to 640 by 640 pixels on a noninterlaced screen. It allows up to 256 colors out of a palette of 262,144 to be simultaneously displayed.

The board can also handle functions such a sector and circle drawing, pattern fill and zooming, according to the vendor.

The Gesvig-4 is priced at \$1,250. Gespac, 100 W. Hoover Ave., Mesa, Ariz. 85202.

# **Data storage**

Telebyte Technology, Inc. has unveiled its **Packetape**, RS-232-based ¼-in. cartridge tape drive system.

Packetape reportedly provides storage of up to 67M bytes of formatted data.

It allows data capture for logging. archival storage or other applica-tions from virtually any RS-232 asynchronous data source without software protocol, the vendor said.

Packetape costs \$2,990 in desktop enclosure

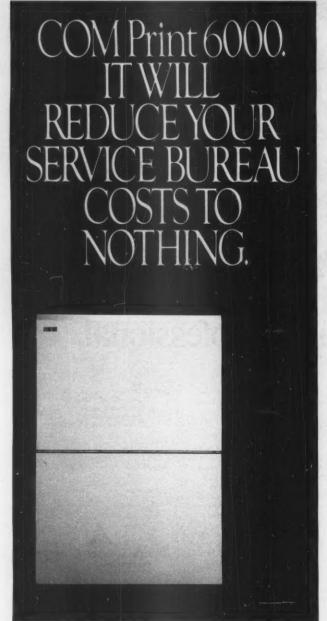
Telebyte Technology, 270 E. Pulaski Road, Greenlawn, N.Y. 11740.

CMS has introduced a 20M-byte, half-height internal hard disk subsystem for the IBM Personal Computer and compatibles called the K-Kit.

K-Kit comes complete with controller card, cables and mounting hardware.

The 514-in. drive reportedly features an average access time of 80 ms. and a 5M bit/sec. transfer rate. The K-Kit is priced at \$595.

CMS, 3080 Airway, Costa Mesa, Calif. 92626.



If you're using a COM service bureau to reduce costs, we've got a big surprise for you.

Now you can save even more by bringing your microfiche printing in-house. All it takes is the new Bell & Howell COM Print 6000.

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# **NEW PRODUCTS**/SYSTEMS & PERIPHERALS

Computer Technology, Inc. has announced the MVM1 memory, an alternative memory designed for Data General Corp. models MV/4000, MV/ 10000 and S/280.

The MVM1 is available in 2M-, 4M-, 6M- and 8M-byte versions. The use of 256K-byte random-access memory on a six-layer board allows up to 8M bytes of memory per board.

memory on a six-layer board allows up to 8M bytes of memory per board.

Addressing on the alternative memory can begin on any multiple of 2M bytes in any available memory slot.

Pricing for the 2M-, 4M-, 6M- and 8M-byte memories are \$4,800, \$7,200, \$9,600 and \$12,000, respectively.

Computer Technology, Unit B, 1442 W. Collins Ave., Orange, Calif. 92667.

### Terminals

Teleprocessing, Inc. has announced the O15/VT100 Emulator, designed to emulate Digital Equipment Corp.'s VT100 terminal for Wang Laboratories, Inc.'s Office Information Systems (OIS) product line.

The emulator is said to allow OIS users to use their workstations to access DEC host computers and other hosts supporting the VT100 terminal and to run DEC applications, such as All-In-1.

The OIS/VT100 Emulator features modem support. Its operational character and user interface follow Office Information Systems standards.

According to the vendor, hardware requirements include Wang OIS 40, 50, 60, 70 or 100 series hardware, at least one OIS-TC or OIS-TC1 telecommunications unit and at least one 64K-byte workstation.

The OIS/VT100 Emulator is priced at \$500 for the 40, 50, 60 or 70 series. The 100 or Alliance series is priced at \$1,500

Teleprocessing, 2nd Floor, 120 Fulton St., Boston, Mass. 02109.

# Printers/Plotters

Output Technology Corp. has announced the release of its OT-700b and OT-777b bar-code printers.

Features include five bar-code

Features include five bar-code printers, 200 line/min printing, 8Kbyte buffer, dual-mode dot-addressable graphics and front and bottom paper feed.

Other attributes include multipitch printing up to 16.6 char./in., Epson America, Inc. FX and Digital Equipment Corp. LA-120 emulation and parallel and serial ports.

Equipment Corp. LA-120 emulation and parallel and serial ports. The OT-777b bar-code printer also offers IBM System/34, 36 and 38 compatibility.

compatibility.

Pricing starts at \$2,095, according to the vendor.

Output Technology, E. 9922 Montgomery Bay #6, Spokane, Wash. 99206.

Calcomp has added the Models 5723, 5725, 5733, 5735 and 5745 electrostatic plotting systems to its 5700 plotter series.

The self-contained units can accommodate media widths of 24, 36 v4 inches and produce plots up to 43.52 in. wide and 500 ft long. Resolution of 200 or 400 dot/in. is available.

Features of the latest models of electrostatic plotting systems include a quick-plotting mode and the ability to accept random vector-plot data directly from the host computer.

The Model 5723 is priced at \$38,700; the Model 5725 is priced at \$43,960; the Model 5733 is priced at \$9,210; the Model 5735 is priced at \$54,455; and the Model 5745 is priced at \$70,455.

Calcomp, P.O. Box 3250, Anaheim, Calif. 92803.

General Business Technology, Inc. has announced the GBT Baby/ Laser Printers for IBM System/34, 36 and 38 computers.

The printers provide 8 page per minute printing. The printers attach to the IBM system via twinaxial cable.

Prices for the GBT Baby/Laser Printers range from \$4,495 to \$6,495. General Business Technology, 1891 McGaw Ave., Irvine, Calif. 92714.

C. Itoh Electronics, Inc. has announced the CIE 3000 S ion-deposition printer.

The printer features Diablo Systems, Inc. 630 emulation, a Motorola, Inc. 6800-based controller with up to 6.5M bytes of random-access memory and a 30 page/min print speed. Up to 32 different fonts can be loaded into memory.

The Dutch 801 in 10- and 7-point fonts and Swiss 721 in 9- and 6-point fonts are standard. The printer can reportedly provide vector and bitmapped graphics and also has a forms overlay capability.

The CIE 3000 S is priced from

\$17,000 to \$20,000.

C. Itoh, 2515 McCabe Way, Irvine, Calif. 92714.

Iris Graphics, Inc. has announced the release of its 2024 Color Ink Jet printer.

The printer is said to produce fullcolor 18- by 24-in. proofs in about 12 minutes.

Features include filmless imaging and 240 dot/in. horizontal and vertical resolution.

According to the vendor, other attributes include absolute dimensional accuracy of images and over 250,000 color shades.

The 2024 Color Ink Jet printer is priced at \$75,000.

Iris Graphics, P.O. Box 508, 41 Elm St., Stoneham, Mass. 02180.



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# **NEW PRODUCTS/SYSTEMS & PERIPHERALS**

Advanced Computer Communica-tions has introduced the LPI 690 Model 2, a laser printer interface designed to be used with the 4050 and 4060 EPS laser printers from Xerox Corp.

According to the vendor, the LPI 690 Model 2 allows Digital Equip-ment Corp. VAX computers to operate the Xerox printers.

The LPI 690 Model 2 includes host symbiont and driver software.

Advanced Computer Communica-

tions LPI 690 Model 2 is priced at \$10,000.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101.

# **Power supplies**

Isoreg Corp. has introduced the PMW series of single-phase, continu-

ous, on-line, pulse-width, modula-tion-controlled Isoguard uninterruptible power systems

The PMW series features dual-microprocessor supervision and 20-Khz pulse-width modulation control at the output power. It is available in 500-vA and 1,000-vA power ratings. Features include continuous self-diagnostics, electronic and manual bypass switches, circuit breaker protec-

tion and multiple outlet sockets.

The 500-vA model costs \$1,495 and the 1000-vA model costs \$1,995. Isoreg, P.O. Box 486, Littleton, Mass. 01460.

Datapower, Inc. has announced a single-output series of modular ultrahigh-power switching power supplies called the DP-7.5K/DP-20K.

The DP-7.5K/DP-20K series comes in 750-, 1,000-, 1,500- and 2,000-watt output versions and three case configurations

According to the vendor, prices for the series range from \$650 for the 750-watt unit to \$1,500 for a 2,000watt model

Datapower, 3328 W. First St., San-ta Ana. Calif. 92703.

# PRICE REDUCTIONS

Conographic Corp. nounced a reduction in the price of

its Cono-Color 40 graphics adapter. The Cono-Color 40 is said to be an IBM-compatible graphics board for use in applications such as Autodesk, Inc.'s Autocad, Micro Control's Cadkey, T&W Systems, Inc.'s Versacad and Personal Cad Systems, Inc.'s P-Cad

Attributes of the graphics adapter include resolution up to 640 by 400 and 512 by 512 pixels, 16 on-screen colors at any resolution and analog and digital compatibility.

According to the vendor, the board now priced at \$695.

Conographic, 17841 Fitch, Irvine, Calif. 92714.

Apple Computer, Inc. has announced price reductions for its personal computer family and Laser-

writer printer.
The Macintosh Plus is now priced at \$2,199, and the Macintosh 512K Enhanced is priced at \$1,699, according to the vendor.

The Laserwriter printer is priced at \$4.999.

Apple Computer, 20525 Mariani Ave., Cupertino, Calif. 95014.

Tektronix, Inc. has announced price reductions for its 4120 series

Graphics Workstations. The 4120 series of Graphics Worktations is composed of the 4125,

4128 and 4129 systems. Base prices now range from \$16,950 to \$29,950.

According to the vendor, prices on options and upgrade kits have also been reduced.

Tektronix, P.O. Box 1000, Wilsonville, Ore. 97070.

Micom-Interian, Inc. has reduced the prices of its Ethernet controllers for personal computer local-area net-

The NI5010 PC Ethernet control-ler, which provides a link-level connection between any IBM Personal Computer, Personal Computer XT or Personal Computer AT and an Ethernet, is now priced at \$595 with on-board transceiver and \$495 without

The NP600 PC Ethernet controller which handles Transmission Control Protocol/Internet Protocol process ing for the Personal Computer AT, is now priced at \$895.

Micom-Interlan, 155 Swanson Road, Boxboro, Mass. 01719.

The Yourdon Division of DeVry Inc. has announced a price reduction for its Analyst/Designer Toolkit for the IBM Personal Computer family.

The toolkit supports Yourdon's Structured Techniques for defining the requirements and designs for computer software and includes features for creating the diagrams ass ciated with structured analysis and design.

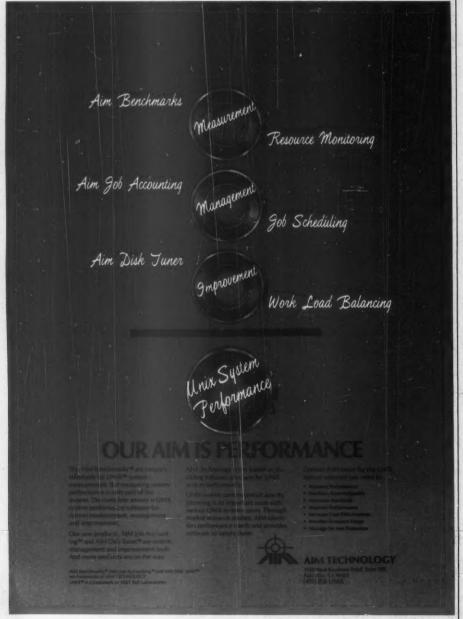
The Analyst/Designer Toolkit is

now priced at \$1,995. Yourdon, 1501 Broadway, New York, N.Y. 10036.

Optotech, Inc. has reduced the price of its 200M-byte optical disk cartridge.

The single-sided write-once disks provide permanent, transportable data and image storage for users of 54-in. optical disk drives. The 200M byte disks are now priced at \$125.

Optotech, Suite 104, 740 Wooten Rd., Colorado Springs, Colo. 80915.



# Michels sees evolving niche for 'personal supercomputer'

# Convergent cofounder tackles another start-up

By Maura McEnaney

To many in the computer industry, Allen Michels is the epitome of a confident Silicon Valley entrepreneur. After founding Convergent Technologies, Inc. in 1979, Michels and three other Convergent executives left the company in 1985 to form The Dana Group in Sunnyvale, Calif.

Soon to be known as Dana Computer, Inc., the company is developing what it calls a "personal supercom-puter" — a Unix-based, reduced instruction set machine that executes between 20 million and 30 million instructions per second (MIPS). The computer, code-named Titan, is targeted for second-quarter 1987 introduction with a price tag of between \$50,000 and \$70,000.

Since its first official gathering in cofounder Ben Wegbreit's home on Dana Street in Palo Alto, Calif., last year. The Dana Group has raised \$11 million in seed money from about 12 different venture capital firms. The firm's roster of 45 employees has some of the industry's top scientists. Dana executives include Bill Wor-

ley, co-designer of Hewlett-Packard Co.'s Spectrum line of computers, and Steven Johnson, author of the C com-



The Dana Group's Allen Michels, relaxing at home with Max.

piler for AT&T's Unix system. Michels was recently interviewed at his Dana Group office.

CW: What exactly is a personal su-

percomputer?
MICHELS: It's a computer with supercomputer-level performance but dedicated to a single user. It has lots of MIPS and megaflops with floatingpoint capability. In this case, it's a machine that will provide anywhere from 20 to 30 MIPS of scalar process-ing and 48 Mflops peak of floatingpoint processing. This machine will not only provide supercomputer performance but also very high resolution graphics.

CW: Where do you see it being used? MICHELS: We see it being used in the next generation of engineering design applications, such as three-di-mensional solids modeling. Another application will be for serious engineering analysis applications - machines at the single-engineer or small engineering department level — for studies in stress mechanics, fluid dynamics and structural analysis. In the scientific area, the machine is especially interesting because simula-tion is being looked upon as an acceptable way of doing science.

CW: What is missing from this mar-

MICHELS: There are machines in the market that do the job very well. However, the principal issue is the cost of acquiring the equipment needed to do the job. The kind of system that we're talking about delivering for \$70,000 to \$80,000 today costs between \$400,000 and \$500,000.

CW: How is a start-up today different from what it was seven years ago when you started Convergent?

MICHELS: I think that's like asking

parents how their children are different. If you subscribe to the idea that a parent would say each of his children is unique, then how could you say otherwise for institutions that constitute groups of different people?

I think that all companies, whether they were formed five years ago or today, go through a type of natural hirth, where there is an immediate instant struggle for survival. They all have a culture that is focused primarily on making the best available use See MICHELS page 116

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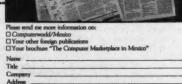
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# Untangling software program copyright laws



OUTSIDE LINES L.J. Kutten

any software developers put a copyright notice on programs they actually want to protect as a trade secret. This is dangerous. While it does not automatically remove the possibility of trade secret protection, such action

The major problem is that this action raises the question of whether the developer was actually seeking trade secret or copyright protection. As a result, the developer may find infringement settlement claims less quickly resolved. This happens because a question of fact can only be decided by a jury, rather than just a

Two prime examples of this type of problem are Management Science America, Inc. v. Cyborg Systems, Inc. (1978) and Technicon Medical Information Systems Corp. v. Green Bay Packaging, Inc. (1980).

In Management Science v. Cyborg, the plaintiff licensed a computer program to more than 600 users under a

trade secret agreement. However, the documentation had a copyright notice. When the plaintiff sued for trade secret infringement, the defendants asked the judge to summarily dismiss the claim

It was argued that distribution to more than 600 customers constituted a general publication under copy-right law, which destroyed the program's claimed trade secret status. It was also argued that distribution with the copyright notice meant the developer was barred from denying it had sought to use copyright protection.

The court refused to issue the summary judgment. It went on to state that the defense hinged on the factual determination of whether distribution to customers was actually publication. If such distribution did constitute publication, trade secrecy was destroyed.

A similar decision was reached in Technicon v. Green. In that case, the developer placed a copyright notice on its proprietary reference man-uals. When it sued the defendant for infringement, the defendant also asked for a summary judgment using the same argument as in Manage ment Science's case. Namely, the plaintiff could not claim the manuals

were a trade secret, since they had been distributed with a copyright notice.

The court refused, stating, "This court is not willing to conclude that, as a matter of law, the mere fact of affixing a copyright notice to the [software] manuals voids any claim of secrecy under Wisconsin's Trade Secret Law.

'In short, a genuine issue of fact exists as to whether or not the mat-ters sought to be protected . . . remain a secret or were, in fact, published by means of the distribution which took place and the affixation of the statutory notice of copyright."

In essence, both courts neither ruled that trade secret protection had been stripped away, nor been controlled. Instead, they said the question of whether the trade secret claim was preempted by the use of a copyright notice was a factual question they could not decide. Rather, it was a question that only a jury could

Kutten is a member of the Missouri and Illinois bars. His book, Protect-ing Computer Software: Law and Forms, will be published later this year by Kluwer Law Book Co.

# Michels sees evolving niche

of every moment to gain strength.
All of these companies must have at their roots a culture of agility, efficiency, productivity and a very high level of focus which ensures that every available resource is always focused on the objective. And what's necessary underneath all that is endurance, discipline and commitment.

CW: What's been the most important aspect of the project for you so far?
MICHELS: The speed at which things have happened has been gratifying, but even more important is the world-class group of computer scientists we have put together. With Bill Worley, Steve Johnson, Randy Allen This research was included in IBM's decision to vectorize Fortran compilers on the 3090], John Reiser, [who did the first Unix port to a Digital Equipment Corp. VAX computer] and Glen Miranker [former director of engineering at Valid Logic, Inc.], we have some of the most brilliant computer scientists in the industry.

CW: How do you lure people like that from a stable, secure environment into a risky start-up?

MICHELS: I think it's the challenging work. It's the excitement of working with a set of collaborators on a project of intense technical interest and with a very strong commercial ap-

CW: But the industry has changed considerably. Hasn't that made a dif-ference in your ability to attract tal-

MICHELS: As is the case with venture capitalists, so it is with people who will join young ventures. They have a greater degree of discrimination and do a more intense analysis of the situation. They also have a greater need to be persuaded that joining a startup is the right thing to do.

If there isn't a strong foundation to begin with, if there isn't an inherent and enduring appeal in the people and in the idea, people aren't going to want to join. I think it's essential that the idea be good enough at the inception of the company so that it at-tracts magnets in the industry people who by virtue of their reputation attract others who wish to learn.

CW: Venture capital has received a lot of criticism lately. Some people feel they have to give away the store to get the venture money. Did you feel that way at all?

MICHELS: I think that people who make those criticisms are fundamen-tally idiots. If you travel all around the world, you'll find entrepreneurial technologists are languishing in other countries. They have good ideas, a commitment to work very hard and a willingness to provide sweat equity in astonishing proportions. It's no different than in the United States. See MICHELS page 117

# MVS/XA deals catching on

From page 142

jump. Such a "stick" type of ap proach is likely to follow the "carrot" that the XA Express represents.

MVS/XA's significance as a contributor to IBM's revenue and profits can best be seen from the following example:

MVS/XA, which accounts for only 12.5% of IBM's mainframe software licenses, contributes more than 30% of its software revenue. By year's end, this operating system will represent about a third of IBM's 1986 software revenue.

IBM's DOS migration strategy has been two-pronged. Conversion to MVS/XA is the option that IBM prefers the larger 4300-type customers to choose

Smaller accounts are being en couraged to run DOS under VM. Either way, IBM wins, since the license fees for MVS/XA or VM/XA exceed those of DOS by a considerable mar-

The VM prong of IBM's DOS migration strategy is reflected in the 8.5% annualized growth of the VM installed base in the March through

September 1986 period.
That makes VM the fastest grow ing 16M operating system. The rise in the number of all MVS licenses during the same period was only 2.7%, despite the fast approach of MVS/

The importance of DOS to IBM is almost a mirror image of MVS/XA. DOS accounts for about 36% of all 370-type licenses but only 12.8% of the revenue.

Therefore, just as the increases in the use of MVS/XA and VM operating systems were predictable, so was the decline in the number of DOS

As of September 1986, an estimated 11,800 were installed in the U.S. down 1% from six months before. A vast majority of the remaining DOS users, 84.3% to be precise, are the 4300 hardware users.

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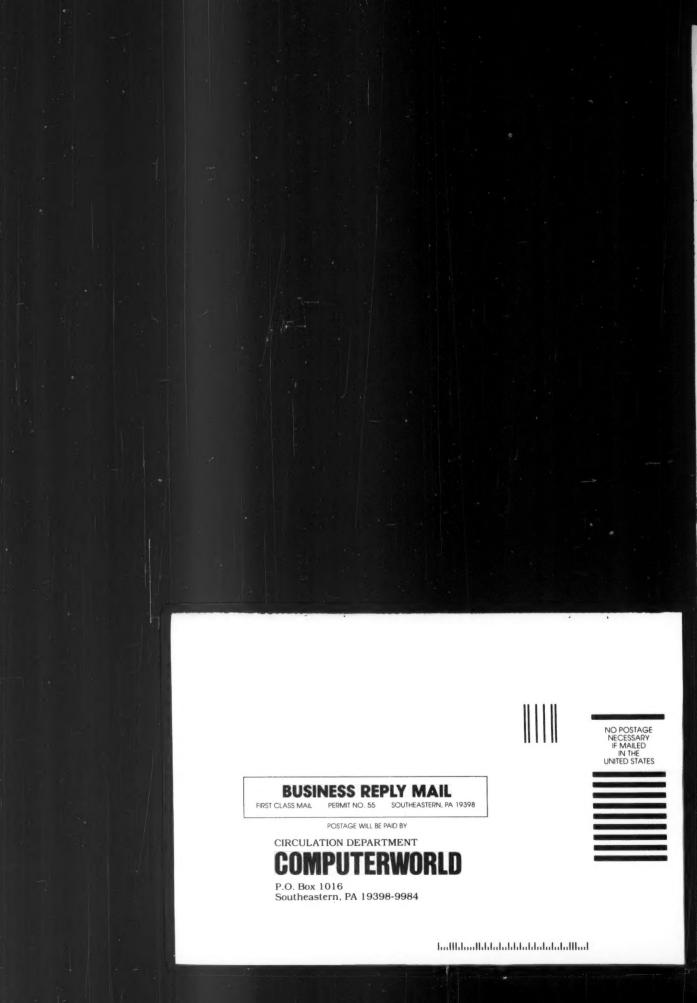


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# Small vendors may be eyeing divestiture

By James A. Martin NORCROSS, Ga.

NORCROSS, Ga. — Intelligent Systems Corp.'s recent decision to put the entire company up for sale could be the first in a series of such moves by other small computer vendors, according to analysts.

"From now until the end of the year, we could be surprised by the amount of similar announcements," says Samuel E. Navarro, technology analyst with Ladenburg, Thalmann & Co. in New York. "It's simply because present tax laws benefit takeovers before Jan. 1, and many high-tech companies feel their stock market prices are undervalued."

Intelligent Systems, parent company of Quadram Corp., Princeton Graphic Systems, Inc., Intecolor Corp. and other microcomputer enhancement vendors, formally announced earlier this month that it plans to sell all or parts of the company, depending on the offers received [CW, Oct. 6]. The firm confirmed last week it was still negotiating, but would not discuss any details.

However, not all analysts believe Intelligent Systems' announcement is a harbinger of things to come. "The time clock for current tax laws is ticking, and there's not enough time to start from scratch and get a deal done before the end of the year," says David B. Guthrie, analyst with

Morgan Keegan, Inc. in Memphis. "So if anyone is thinking about doing something similar, they'll have to come forward quickly."

The announcement was designed to spur investor interest in Intelligent Systems as well as immediately increase the value of its stock, both of which have been accomplished. The day after the announcement, the company's stock rose \$2 a share to \$7.75; last week, it closed at about \$8 a share.

### in the dark

Intelligent Systems is closely guarding its talks with potential buyers, and analysts admit they are in the dark about the company's progress to date. "I think there is a good chance that someone will buy the whole company," Navarro says, "but perhaps an even better chance that someone will buy Princeton Graphics or Intecolor, as those have been the most profitable divisions."

There is some disagreement and concern among industry observers that IBM's expected microcomputer, based on the Intel Corp. 80386 microprocessor, might be a "closed box," with little need for add-on memory and graphics boards. If that is true, some analysts say the future of companies like Quadram could be in jeopardy, hurting Intelligent Systems'

chances for an easy sell.

"I believe that the standard functions of a PC — the serial and parallel ports, memory, graphics and disk-drive controllers — will be integrated all in the mother board, and that doesn't leave a lot for the add-on people," says Donald Heeter, technology analyst for J. C. Bradford & Co. in Nashville.

Add-on and enhancement companies will continue to remain viable but will have to deal with an increasingly competitive marketplace, Guthrie says. "Unless IBM closes up the architecture on a 386 machine dramatically, which we don't expect, we feel there will always be a market for accessory manufacturers to fill in the void," he adds.

Navarro estimates that Princeton Graphic Systems generates some \$50 million in annual sales and Intecolor about \$20 million, and that both are money-making operations.

Quadram, perhaps Intelligent Systems' best known division, brings in about \$50 million in sales but is barely breaking even or perhaps even losing money, Navarro adds. Intelligent Systems should be worth between \$110 million and \$115 million, sold either collectively or individually.

Intelligent Systems does not break out sales and income figures for its divisions.

# Michels sees evolving niche

From page 116

But in these other countries, there is no risk money around. There's a very conservative banking mentality ev-

In the United States, we're blessed with the capability of being able to go out — a bunch of unknowns, with very limited credentials — and raise millions of dollars.

In the absence of any comparable capability anywhere else in the world, how could you possibly criticize the people who are willing to put hard-earned money at risk with unlargence.

Only in America can you do this and get rich as a result of it, if you are successful.

CW: Is there a way to get rich with venture capitalists still in the picture?

MICHELS: Venture capitalists get rich only if the people with whom they invest are absolutely motivated to do

I have never seen greed and avarice among venture capitalists. They all would like to optimize their investments and get the best value for the money.

That's their job.

If I were an investor, I would want that, too.

CW: Are we ever going to hear the true story of your exodus from Convergent?

MICHELS: The true story of the Convergent exodus is that we got a business idea one day and we left the company literally the next day. Just like that.



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# AT&T slowly fading from computer business, analysts say

# Communications to remain core business

By lass S Barman

CHICAGO — In the days following the 1983 divestiture of AT&T, industry analysts envisioned a free-for-all with AT&T muscling into IBM's computer territory — and IBM battling for control over the communications networks of large corporations.

That is not quite the way things turned out, according to the Gartner Group, Inc. In the battle for the hearts and souls of MIS managers, the consulting group contended, IBM is clearly ahead.

AT&T has seemingly backed off its computer initiative, Dale Kutnick, the Gartner Group's executive vice-president of research, said at the consulting firm's recent seminar on the future of AT&T. Sales of the company's 3B series of computers have been less than spectacular — and are far less important to AT&T revenues than the sale of bandwidth and private branch exchanges.

"AT&T is backing out of the computer business, slowly." Kutnick said. He noted that AT&T prefers to resell office equipment from Ing. C. Olivetti & Co. — and may one day elect to resell mainframe equipment from Fujitsu Ltd.

Meanwhile, IBM has taken a num-

ber of steps to hold on to its mainstay computer business and to add network management products to it as a growth area. Along with its partners, Rolm Corp. and MCI Communications Corp., IBM believes it can present MIS managers with an end-to-end network solution that AT&T cannot. "The battle," Kutnick said, "will

"The battle," Kutnick said, "will really take place in communications software and network management. That's because IBM doesn't care if you're using leased lines or switched signals, as long as IBM data is going across them."

Michael Schumer, vice-president of the Gartner Group's communications research and consulting group, told the more than 100 attendees that AT&T could expect steady growth from its core businesses of communications services and sales of private branch exchange switches and customer premise equipment.

In 1985, AT&T generated \$34.5 billion in revenue, nearly half of it from sales of communications services. Growth will be slow but steady, Schumer said, with 1990 revenue estimated at \$38.4 billion, 66% of that from sales of services. By 1995, Schumer said, AT&T should be at the \$51.3 billion mark, roughly IBM's size today.

IBM stands to generate more growth in the areas of private branch exchange sales and network management software, Gartner Group analysts said. That sustained growth in PBX sales is expected to benefit AT&T, too—with AT&T doubling its present 24% market share by 1991.

From an MIS perspective, however, the competition is more one-sided. IBM already owns more than 80% of all large commercial mainframe sites. It is in position to build upon that base with strategic networking products.

AT&T, in contrast, provides MIS managers with bandwidth, but that business could easily be fragmented by 1990, as alternate sources of capacity become more widespread.

pacity become more widespread.

Perhaps more critically, AT&T lacks many key products that would allow MIS managers to direct a national or international data network.

To grow in the computer business, AT&T has decided to pursue joint ventures with Olivetti Corp., N.V. Philips and Fujitsu Ltd.

IBM, meanwhile, is wasting no time preparing further forays into AT&T territory. IBM is considering several plans to sell T1 multiplexers, Kutnick said.

Bozman is a Computerworld contributor based in Chicago.

# AT&T garners defense contract

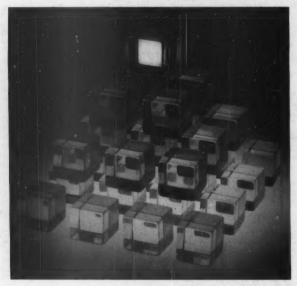
WHIPPANY, N.J. — Despite AT&T's recent corporate hints that it may be scaling back its efforts in the computer business, the telecommunications giant was awarded a defense contract last week to develop parallel processing computers.

The three-year, \$7.7 million contract from the U.S. Defense Advanced Research Projects Agency calls for scientists at AT&T Bell Laboratories to build a prototype computer for speech and image recognition and complex patternmatching tasks. The goal is to parallelize those tasks to greatly increase the speed at which computers can recognize large-vocabulary human speech.

AT&T will attempt to extend

the Dado parallel processing architecture developed by Fifth Generation Computer Corp. of New York and develop new software. A working prototype is expected by next spring.

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# **Europe acts** on U.S.-Japan chip accord

By Alex Scott STRASBOURG, France — The European Community (EC) has decided to open formal proceedings against the agreement reached in July be-tween the U.S. and Japan on semiconductor trade. The EC will bring the action under the General Agreement on Tariffs and Trade (GATT).

Announcing the decision here re-cently, the European Community Commission confirmed that an official request to open consultations over the agreement had been lodged with GATT authorities in Geneva.

According to a statement that was issued by EC Trade Commissioner Willy de Clercq and Industry Commissioner Karl-Heinz Narjes, the U.S.-Japan agreement "contains elements which call into question the rules of international trade and the legitimate interests of the European

EC officials have argued that the

77

According to the latest statistics, U.S. chip makers account for about 10% of the Japanese semiconductor market.

U.S. failed to provide the EC with as surances that the agreement would not involve price fixing on the European market or reserve a part of the Japanese market for U.S. semiconductor manufacturers.

Officials at the commission re-ferred to a so-called secret clause of the agreement that allegedly refers to a doubling of Japanese semiconductor imports over five years, mainly to the benefit of U.S. producers.

According to the latest statistics, U.S. makers account for about 10% of the Japanese semiconductor market: others, including the EC, account for

The statement issued by the com-mission makes it clear that European industry is largely dependent on imported semiconductors for the mo-ment and that the EC thinks it is "not right that prices in this sector should be set arbitrarily by the U.S. and Japan.

statement continued, would also be unacceptable that U.S. firms should be privileged on the Japanese market. This would constitute, on behalf of the two largest international trading partners, a fla-grant and potentially damaging contradiction of the willingness ex-pressed in the GATT talks, held recently in Punta del Este, Uruguay, to liberalize trade for the benefit of the international community."

Scott is a Brussels-based corre spondent for the European bureau of the CW Communications International News Service.

# MSA reports 25% boost in quarterly revenue

# Continues upswing after dismal 1985

By James A. Martin ATLANTA —

ATLANTA — Management Science America, Inc. (MSA), continuing on the upswing after a dismal 1985 fiscal year, last week reported a 25% increase in operating revenues for the third quarter. Sales reached \$38.8 million, compared with \$30.9 million for the same quarter last

reported net income of \$260,000, or 1 cent per share, compared with a 1985 third-quarter loss of \$3.5 million, or 20 cents per share. The third quarter, however, lagged behind this year's second quarter, when net income was \$5.9 million.

### Revenue up for '86

For the first nine months of 1986, revenue was \$115.8 million, compared with \$94 million in 1985. Net income was \$5.8 million, against a loss of \$3.2 million in the first three

quarters last year.
"MSA has definitely regained its footing," said Brian Mutert, software analyst for Robertson, Colman and Stephens in San Francisco.

"But the company has not achieved the level of profitability that one would hope for to improve

its near-term investment appeal," Mutert continued.

Much of MSA's earnings are a result of aggressive capitalization and research and development, Mutert

"But it will take the company an-other year of healthy revenue growth to get operating margins back to a strong level," he said. MSA has embarked upon a busy

acquisition campaign to gain a more secure foothold in vertical markets such as education and manufacturing software.

For the long term, this strategy will pay off, according to Mutert.



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# Computer services firms evolving into full-service vendors

By Ninamary Buba Maginnia Most fast-growing computer service companies are increasingly sharing one attribute - the commitment to provide customers with just about any service they could ever need.

These firms are evolving into fullservice vendors whose goal is to pro-vide comprehensive solutions for a single market. The trend is due, in part, to how users are changing their computing requirements.

Customers are moving their applications out of the back office, where mundane, batch-oriented work was performed, into front office — or "mission critical" — applications that perform essential daily business operations, according to Ken Burke, vice-president of research at Alex Brown & Sons, Inc. in Baltimore.

Technology has advanced so rapidly that many MIS managers have curtailed buying sprees and are taking time to assess information systems, Burke says.

### Realigning system strategies

The computer industry slowdown can be blamed partly on user compa-nies realigning their system strategy. When these firms begin buying again, they will lean toward companies that can offer a full range of services, many analysts say. "A full-service vendor is one that

can satisfy a broad range of customer information processing needs by providing solutions for customers' prob-lems," Burke says.

"Without a full-service strategy, growth can be limited," adds Cato Carpenter, a financial analyst with Alex Brown. "The strategy is to go after as much of the data processing budget as possible. If you only go for that which software can provide, you're limiting yourself. That's why vendors are targeting large opportu-

### **Industry success story**

One of the services industry's big-gest success stories, Automatic Data Processing, Inc. of Roseland, N.J., experienced enormous growth over the last few years because it consistently

expanded its product line to meet customers' increasing needs, according to Automatic Data Processing President William Turner.

"The leading edge in service is far more important than technology even if the technology is used in the service," Turner says.

Computer service firms should offer customers all they need — service — as opposed to all that is possible — technology," Turner explains.

### Lavering services

Turner's company offered payroll services to customers and then layered more services on the initial offering, creating more revenue. The firm added direct deposit, tax filing and administrative personnel tasks.

Five years ago, Automatic Data Processing concentrated on small business and, from an average customer, netted about \$3,000 in yearly revenue. Today the firm's average customer provides \$30,000 in yearly revenue with some contributing as much as \$2 million a year.

Even small companies can lever-age their customers by expanding services in their market niche, Carpenter says. Service vendors can also provide hardware by selling vendor equipment via an OEM channel, eliminating the need for customers to buy directly from the computer manufacturer, he notes.



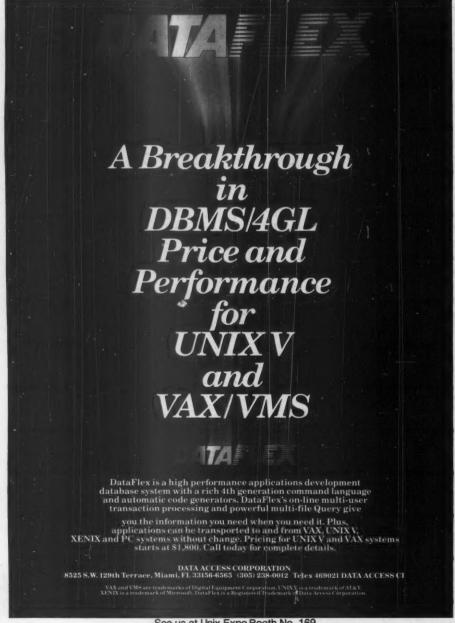
Computer Task Group, Inc. an-nounced that revenue for the third quarter ended Sept. 30 increased 24% to \$36.5 million, operating income went up 17% to \$2 million and pretax earnings rose 23% to \$2.2 million.

Since the company is providing for a higher tax rate than in the previous period, net after-tax income increased 6% to \$1.2 million. Because the average number of common shares outstanding for the period was 7,492,000 vs. 6,418,500 (adjusted for splits), earnings per share were 16 cents vs. 17 cents in the third quarter of 1985.

Motorola, Inc. reported revenue for the third quarter of \$1.43 billion, up 10% from \$1.30 billion in the third quarter last year. Profits were \$31 million, or 24 cents per share, compared with a loss of \$39 million, or 33 cents per share, last year.

Micom Systems, Inc. reported net income of \$2.8 million, or 16 cents per share, on revenue of \$48.1 million for the second quarter, ended Sept. 30. This compares with net income of \$2.7 million, or 15 cents per share, on revenue of \$47.1 million in last year's second quarter.

Bridge Communications, Inc. announced revenue for the third quarter ended Sept. 27 of \$12.2 million, a 51% increase over the \$8.1 million reported in the like quarter a year ago. Profits were \$1.4 million, or 17 cents per share, compared with \$1.4 million, or 16 cents per share, a year ago.





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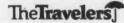
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# **Burroughs posts \$2.6B sales**

# First quarter as merged firm nets \$52.9M profits

**By Alan Alper** 

DETROIT — Turning in the first financial results since it acquired Sperry Corp. last month, Burroughs Corp. last week posted third-quarter earnings of \$52.9 million on revenue of \$2.6 billion.

Burroughs alone earned \$32.2 million in the like period last year on revenue of \$1.1 billion.

Burroughs declined to break out Sperry's contribution to third quarter results. Sperry earned \$42.7 million on revenue of \$1.3 billion from continuing operations in the third quarter last year. The firm, however, lost \$187.9 million after taking a \$220 million loss on the sale of its New Holland farm equipment division. Commenting on the results, Burroughs Chairman W. Michael Blumenthal said that "strong international performance, helped by a weaker dollar, offset generally weak conditions it the U.S."

Blumenthal also noted that continuing operations at both Sperry and Burroughs showed "low double-digit growth" on a year-to-year comparative basis. "We are encouraged by the positive response we have received from the Sperry customer base," he added. "This is reflected by a substantially improved order flow this quarter and reverses the disappointing order level that Sperry experienced in the June quarter."

On the whole, Burroughs said, international business more than offset a relatively flat showing in the U.S. Strong worldwide order growth in commercial products offset a decline in the defense business, the firm add-

# Televideo, Tandon gamble on AT-compatible market



ACTIVE ISSUES
Kathy Porteus

and Televideo Systems, Inc. (TELV — 2¼) have much in common these days.

Both companies are attempting to penetrate the intensely competitive market for IBM Personal Computer AT-compatible computers. Both have suffered sizable losses in their traditional core businesses — disk drives and ASCII terminals, respectively. And both are issues selling at less than \$3 per share, compared with three years ago when both were trading in the \$30 to \$40

Analysts give each company a 50-50 chance of successfully making the transition to computer systems supplier. Nevertheless, such a combination of shaky financials and an uncertain future attracts investors who are willing to bear a high level of risk to see such turnaround stories end happily.

"Tandon had a good strategy for becoming a systems manufacturer," says James Stone, analyst with Shearson, Lehman Brothers, Inc., "but this strategy has proven more difficult to implement than had been originally anticipated."

Steven Ossad, of L. F. Rothschild, Unterberg Towbin, says Tandon has signed on slightly more than 600 retail dealers, but that it expected to have roughly 1,000 by this time. "In anticipation of a higher level of sales," Ossad says, "Tandon probably overbuilt," causing a financial squeeze and layoffs.

For the fiscal year ended Sept. 30, Ossad estimates Tandon will report revenue of \$205 million to \$210 million and lose 55 cents per share on operations and that the firm may write off more than the costs related

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms. to closing a disk drive facility.

Tandon's retail efforts suffered a setback recently because of the departure of its highly visible director of sales and marketing, former IBM veteran H. L. "Sparky" Sparks, who resigned for personal reasons. While Sparks' resignation may initially slow Tandon's retail strategy, it should not represent a serious challenge to Tandon's existing dealer structure, analysts say.

The company also continues pursuing its OEM systems business, having already pocketed agreements with Tandem Computers, Inc., Xerox Corp. and Siemens AG.

Tandon's recent reorganization, separating its disk drive and computer systems operations, caused speculation that the company may intend to sell its battle-worn peripherals business to help raise needed cash. According to Shearson's Stone, however, Tandon will not likely abandon a few drive models that are crucial to its personal computer strategy.

According to Rothschild's Ossad, the upcoming holiday selling season is particularly important for Tandon, because a good showing could facilitate signing on more dealers as well as boost investor confidence in the company's turnaround. "If word starts spreading that Tandon is selling retail PCs better than people think, you'll quickly see a \$6 stock," Ossad says.

Whereas news of a good Christmas may cause Tandon's stock to jump, Televideo shares will not move significantly until the company shows sustainable profitability, according to Samuel Navarro, director of technology research for Ladenburg, Thalmann & Co. of New

For the fiscal year ending Oct. 31, Navarro estimates Televideo will earn about \$500,000, compared with a \$19 million loss last year. "I think there is a 50-50 chance Televideo will have a very good 1987," Navarro says, "which means earning \$11 to \$12 million after taxes, or about 25 cents per share."

Unlike Tandon, which has focused entirely on systems, Televideo is trying to regain a leading position in the ASCII terminal market.

# Slide persists Apollo, Sun up

From page 142

of looking at what the market required and hitting it right," noted Hank Kellog, an analyst at The Yankee Group in Boston. "They realized they needed a low-cost workstation and faced up to the fact that their own operating system was no longer acceptable and needed hooks into IBM."

International business, which comprises a little less than half of Apollo's revenues, remained strong, Newton said, adding that the trend in domestic orders is encouraging.

• Sun Microsystems. Revenue for the firm's first fiscal quarter, ended Sept. 26, increased 172% to \$91.6 million, while profits soared 570% to \$6.7 million.

"We believe the strong results reflect further industry endorsement of our open systems philosophy of distributed computing," said Sun's Chief Financial Officer Robert G. Smith.

The Yankee Group's Kellog agreed.
"Sun has argued all along for an open systems approach by using standards like Unix and the Motorola, Inc. 68020," he said.

• Amdahl Corp. The Sunnyvale, Calif., IBM-compatible mainframe vendor posted third-quarter earnings of \$7.1 million, up 25% from the same period last year, although revenue remained flat at \$220 million.

Louis Giglio, a market research analyst at Bear Stearns, Inc., said Amdahl was hurt by delays in shipping its IBM 3090-compatible CPU, the

• Honeywell, Inc. Citing ongoing weakness in the U.S. computer and industrial markets, the Minneapolis mainframe maker reported third-quarter profits of \$32.4 million, down 42% from the like period last year. Revenue increased 6% to \$1.66 billion in the quarter.

Third-quarter earnings included a \$6.4 million charge associated with a reduction of jobs in the company's computer and controls operations in Phoenix, Honeywell said.

Honeywell Chairman and CEO Edson Spencer said operating profit in the Information Systems Group was down sharply, although the firm does not quantify quarterly results for its individual groups.

Total orders for the company increased in the third quarter, Spencer said, noting that computer orders increased in both the U.S. and international markets.

● NCR. Continuing to buck the mainframe industry trend, NCR reported revenue increased 13% to \$1.17 billion, although third-quarter earnings of \$73.3 million were up just 2% from the year-earlier period.

Chairman Charles Exley Jr. said that while he was disappointed that third-quarter results were slightly below expectations, he was happy that the firm posted an increase in both profit and revenue.

Bear Stearns' Giglio, like other analysts, continues to be concerned about NCR's personal computer business despite recent order increases. "They're still not profitable in PCs and have one of the highest costs of manufacturing because their products are built in Germany," he said.

"They should get out of the retail and the low end of the business and contract out manufacturing."

• Apple. Completing its reversal of fortune, the microcomputer firm posted fiscal 1986 earnings of \$153.9 million, up 151% from last year, on flat revenue of \$1.9 billion.

The Cupertino, Calif., firm posted fourth-quarter profits of \$32.8 million, up 47% from the year-earlier period on a revenue increase of 25% to \$510.7 million.

Analysts attributed the improved results to tighter fiscal controls and increased demand for the Macintosh and Apple II product lines

and Apple II product lines.
Chairman and Chief Executive
John Sculley said that during the
fourth quarter, Apple's Macintosh
and Apple II gained momentum in the
business and educational markets,
respectively.

Apple's improved performance in the business market is the result of its niche strategy, noted Tom Galvin, an analyst with Shearson Lehman Brothers, Inc. in New York, positioning Macintosh and its laser printer as a desktop publishing solution.

# Floating Point exec resigns

By Ninamary Buba Maginnis

BEAVERTON, Ore. — Amidst reports of another poor quarter, Floating Point Systems, Inc. announced a change of command last week.

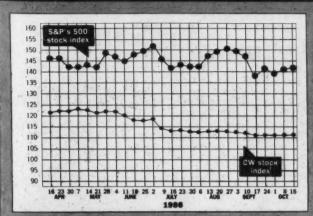
Lloyd D. Turner resigned as president, chief executive officer and director. He will be retained as consultant for the T Series computer. "I was a little surprised it didn't happen sooner," said Gary Smaby, an analyst with Minneapolis-based Piper, Jafray & Hopwood, of Turner's resignation.

Milton R. Smith, board member and general counsel, was voted interim chairman and chief executive officer. George P. O'Leary, a former vicepresident and director, will serve as president, chief operating officer and director. Chairman C. N. Winningstad will serve as vice-chairman.

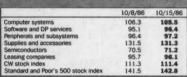
The firm also said it expects its fourth-quarter operating loss to exceed its \$3.9 million third-quarter operating loss.

Floating Point is also in the throes of transition, changing from an OEM organization to an end-user firm, Smaby said. The loss of a major contract with General Electric Co. spurred the metamorphosis, he said.



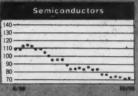


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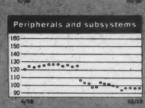


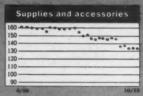
Computer systems











# **Computerworld stock trading summary**

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OPANAZOROZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ	DAISY SYS CORP DATA GEN COMP D	19 1 18 1 26 2 2 1 1 18 1 26 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	61650875342549901335119466755182217	6.75   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25   19.25	+0.2 -0.1 -0.8 -0.1 -0.6 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1	+ 2.8.2
		ES & ACC				
NANNON	IMMER BUSINESS PRODS BLARRY WRIGHT CORP DUPLEX PRODS INC ENNIS BUSINESS FORMS INC 3M CO MODRE LTD STANDARD REGISTER CO WALLACE COMPUTER SVCS	25 1 23 1 28 1 116 7 28 1 50 3	15 15 18 17 18 12 15	27.00 15.63 19.13 23.00 107.25 20.50 33.26 38.50	+1.0 -0.5 -0.9 -0.8 +6.5 -0.1 +0.5 -1.4	+3.8 -3.1 -4.4 -3.2 +6.5 -0.6 +1.5 -3.4

EXCH: N-NEW YORK; A-AMERICAN; P-PACIFIC; B-BOSTON; L-NATIONAL; M-MIDWEST; O-OVER-THE-COUNTER; S-SPLIT O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID (1) 170 NEAREST DOLLAR

CLOSING PRICES W	EDNESDAY, OCTO	OBER 15, 198	36 -				
E X C	52-WEEK RANGE (1)	CLOSE OCT 15 1986	WEEK NET CHNGE	WEEK PCT CHNGE			
SOFTWARE & DP SERVICES							
A DUNANCED COMP TECH A DUNANCED SYS INC.  A DUNANCED SYS INC.  A AMERICAN MIGHT SYS INC.  A AMERICAN SOFTMARE INC.  A ASTRONYE COMP INC.  A ASTRONYE COMP INC.  A STRONYE COMP INC.  A STRONYE COMP INC.  A STRONYE COMP INC.  A STRONYE COMP INC.  COMPUTER SYS INC.  COMPUTE	P 15 102 10025 102 10025 102 100 11 100 10 10 10 10 10 10 10 10 10 10 10 10	5.07.5   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75   13.75	+0.01 +0.01 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 +0.04 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	SEMICONDUCTORS						
N ADVANCED MICRO DEV ANALOGIC CORP ANALOGIC CORP APAPLIED MAGNETICS CORP AVANTER INC HADCO CORP INTEL CORP MICRO MASK INC MOTOROLA INC NATIONAL SEMICODUCTOR TERADYNE INC	34 13 25 15 16 10 20 12 24 15 7 3 32 16 7 2 50 31 8 16 8 30 16	14.75 16.36 10.75 14.00 15.50 4.00 19.25 2.88 35.36 9.50 16.38	+1.0 +0.0 +0.5 -0.5 +0.3 +0.3 -0.3 -0.3	+7.3 +0.0 +0.0 +3.7 -3.1 +6.7 +4.1 -8.0 -0.7 +2.7 -1.5			

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# INSTANT ANALYSIS

"Our industry focus is showing good results, particularly in financial services. where we have won significant new business."

Kenneth H. Oise president. Digital Equipment

# Mainframe slide persists; Apollo, Sun post gains

While mainframe vendors continue to suffer the negative effects of the 2-yearold computer industry slump, engineering workstation vendors appear to be enjoying a business boom, according to third-quarter financial results released last week

Apollo Computer, Inc. and Sun Microsystems, Inc. posted robust results, despite strong incursions made into the engineer-ing workstation market by Digital Equipment Corp. and, to a lesser degree, IBM. Decreased third-quarter profits at Hon-eywell, Inc. and flat revenue at Amdahl Corp. reflected continuing difficulties within the mainframe market, analysts said

NCR Corp., which offers a more diversified computer product line, remains the exception among the traditional mainframe companies. NCR's revenue and profits climbed in the third quarter, although not at expected rates because of a moder-

ated growth rate in overseas business.

Meanwhile, Apple Computer, Inc. showed strong financial gains, reflecting inroads made into the office environment and continued strength in the education

. Anollo, The Chelmsford, Mass -based engineering workstation vendor reported third-quarter revenue of \$100 million, up 82% from the year-earlier period. Net income was \$2.46 million, compared with an \$18.4 million loss reported in the like period last year.

Apollo Vice-President and Treasurer

John H. Newton pointed to the response to the firm's new Domain Series 3000 personal workstation and an almost doubling of its installed base to 27,000 as reasons for the firm's dramatic turnaround. The company also increased corporate accounts by 700 to 1,700, he said.

'Apollo's rejuvenation is a result

See SLIDE page 140

# NAS says OEM deal still solid

# Claims Hitachi's U.S. plans won't alter pact

MOUNTAIN VIEW, Calif. - Officials of National Advanced Systems Corp. (NAS) and the U.S. subsidiary of Hitachi Ltd. last week insisted that Hitachi's U.S.-based manufacturing operation does not jeopardize NAS's long-standing OEM agreement to sell Hitachi mainframe

"I don't see how a change in Hitachi's manufacturing strategy begets a change in their marketing strategy," said David Turner, vice-president and general manager of product operations for NAS.

"Fujitsu America, Inc. has been doing for years in the U.S. what Hitachi is just starting to do, but no one talks about the Fujitsu-Amdahl Corp. relationship disap-

pearing," Turner added.

Japan-based sources within Hitachi said recently that the Japanese electronics giant is considering the sale of Hitachi-la-beled mainframes in the U.S. [CW, Oct. 13].

Currently, Hitachi mainframes in the U.S. are all privately labeled by NAS. Last year, Hitachi opened its first production plant in Norman, Okla

Yasushi Sayama, deputy general man-ager for Hitachi America Ltd., said the firm currently plans to make only large 5G-byte disk drives at the Oklahoma facility. He said Hitachi has formed a group to consider the feasibility of building lowend workstation products there but that the firm has no plans to make mainframe processors in the U.S.

"Our relationship with Hitachi has never been better." NAS's Turner added.



INDUSTRY INSIGHT **Bob Diurdievic** 

# MVS/XA deals catching on

BM's 1986 MVS/XA conversion sweetener, nicknamed the XA Express, seems to be producing results. In the last six months, IBM has signed up almost 2,000 additional MVS/ XA licenses. That's a 59% growth on an annual basis. As of September 1986, MVS/XA accounts for an estimated one third of IBM's OS-type licenses, up from about 25% six months before and only 10% in March 1985.

The XA Express is primarily aimed at the DOS and VM installed base. IBM's offer to these customers includes eight months of free MVS/XA use plus an additional 12 months of half-price charges. Considering the large size of the DOS installed base, with about 2,000 licenses worldwide, it is conceivable that a significant percentage of the 2,000 new MVS/XA licenses may have originated from the DOS world.

That's exactly the type of marketing program envisioned last February, when it appeared that IBM was likely to sweeten the pot for its users through some special marketing programs. One time discounts help speed up conversion to MVS/XA without jeopardizing IBM's long-term returns from it.

At the same time, however, IBM may increase the fees it charges for the older release of its operating system in order to bridge the gap between the older software and the XA products, thus making it easier to justify the

See MVS/XA page 116

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

# No end in sight for chip makers; Intel, AMD report losses

# U.S. firms cut costs. hope to ride out slump

By James A. Martin

There was more bad news in the semiconductor industry recently as Intel Corp. and Advanced Micro Devices, Inc. (AMD) announced huge operating losses and another round of cost-cutting moves.

Although the firms attributed a large portion of those losses to earlier cutbacks and expressed guarded optimism for a stronger fourth quarter, the U.S. chip industry is seriously depressed and will remain so for some time to come, analysts said.

In addition to quarterly losses of \$46.9 million and \$114.2 million, respectively, Advanced Micro announced the elimination of 500 jobs, and Intel Corp. said it is discontinuing its bubble memory operations.

With even IBM, one of the semiconductor industry's largest customers, expected to continue to report sluggish sales and earnings, there is little hope for the chip industry to pick up, said Matt Crugnale, presi-dent of Crugnale & Associates, a Mountain View, Calif., consulting

The semiconductor industry has been spending more time looking at what used to happen instead of what is happening," Crugnale said.

Semiconductor billings for three-month period ending in September rose slightly, however, according to the Semiconductor Indus-

'The industry will continue to improve in the next few months, but it is difficult to develop a strong climate in a slow high-tech capital spending environment, ' said analyst Edward C. White of E. F. Hutton &

Intel's net loss of \$114.2 million for the third quarter compared with a net loss of \$3.6 million in the same quarter last year. The Santa Clara, Calif., chip vendor said revenue was \$324 million, compared with \$312 million last year.

Intel's net losses were higher than those in the 1985 quarter due to the creation of a \$60 million reserve de signed to cover the costs of phasing out the company's bubble memory operations. The reserve will also fi nance the previously announced clos-ing of Intel's Barbados production plant and the layoff of approximately 1,320 employees, according to the company.

While analysts agreed that Intel

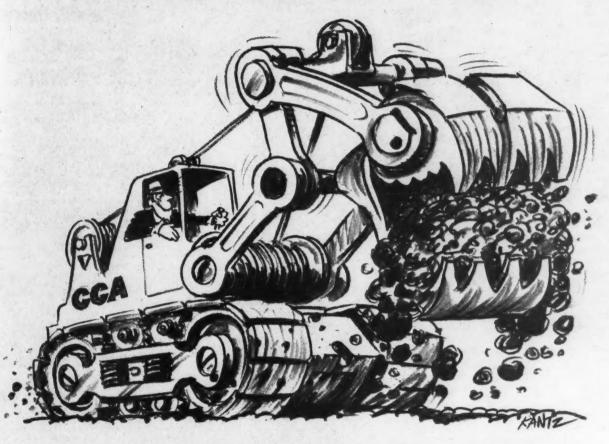
has made the necessary cutbacks and should soon experience slight improvements, they were not as optimistic about Sunnyvale, Calif.-based

"Advanced Micro tends to be much more dependent on the minicomputer and mainframe manufacturers, and their orders have been flat on a sequential basis while their cost struc-ture has been quite high," White

AMD reported a \$46.9 million net loss for its second quarter, compared with a year-earlier loss of \$15.3 million. Sales were \$157.7 million, up from \$128.1 million.

As expected, the company laid off 500 employees, its first staff reduction in 10 years. Depending upon industry performance, additional layoffs could be forthcoming, observers

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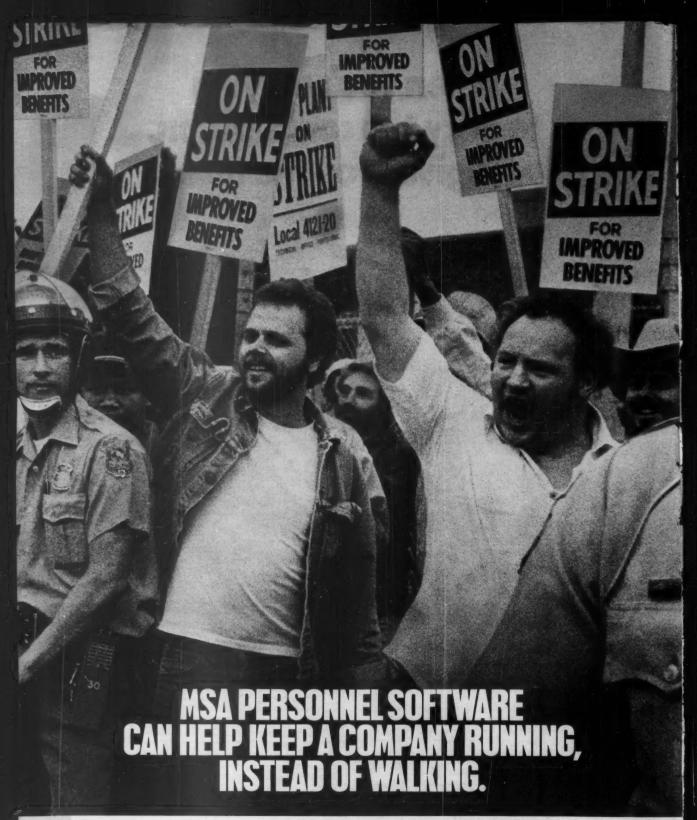
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